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ABSTRACT

This paper reviews and analyzes labor market trends to provide information for business and marketing program planners. Emphasizing the demand side of the market, the paper considers only those aspects of labor markets that have an impact on the supply of students to business and marketing programs and the demand for graduates of those programs. Some of the following trends are found in the analysis: (1) service occupations will provide all net employment gains for the next decade; (2) advances in information technologies will affect skill requirements for business and marketing occupations; (3) the pace of technological change requires increased occupational training for employees at all levels; (4) micro-marketing techniques will be more widely used in the 1990s; (5) businesses will compete more on product and service quality and less on price; (6) the business and marketing student population will be older and disproportionately female; (7) employees and the programs that prepare them will need to focus on the skills needed in changing, flexible work environments; and (8) more demand for marketing programs will come from existing employees than from young college students. (26 tables, 90 references) (KC)

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INTRODUCTION

Labor market trends affect both the number of students who choose to enroll in the Wisconsin Vocational, Technical, and Adult Education (VTAE) system's business and marketing programs and the employment opportunities available to those students upon graduation. This paper reviews and analyzes labor market trends to provide information for business and marketing program planners.

This paper considers only those aspects of labor markets that impact the supply of students to business and marketing programs and the demand for graduates of those programs. The emphasis of the paper is on the demand side of the market. Ideally, the supply of students should just equal the demand for graduates. Given this situation all business and marketing graduates would find jobs related to their chosen fields. The past record shows that the Business and Marketing Division has been successful in approaching this ideal. Over the past four years, 76 percent of Business and Marketing Division Associate Degree program graduates found jobs related to their degrees within a few months after graduation (VTAE Follow Up Surveys 1985-1988). The analyses and data contained herein provide a resource to continue to build upon this record.

The paper focuses upon the implications of structural changes in the economy that are affecting the demand for and supply of students. Structural change suggests an evolution of the productive linkages that comprise an economy. It results from changes in consumer tastes and the adoption of new technology by business. Structural changes affect the demand for business and marketing graduates by creating new occupations and by altering the demand for existing occupations. The effects of structural changes in the labor market can significantly influence the employment prospects of students.

The impact of changed tastes and new technologies on the demand for employees is distinct from the effect of macroeconomic growth or decline. Structural effects on labor markets differ from the effects of a generally strong or weak economy because of their unevenness. Structural changes impact the various industries and occupations differently. Structural change causes some industries to prosper while others fail. It causes shortages of labor to co-exist with unemployment.

The unevenness of structural change suggests that its effects on the labor market can be analyzed by looking at changes in the composition of employment. Structural change should cause the share of employment accounted for by some occupations to decline and the proportion of employment represented by other occupations to increase. For example, some evidence of the impact of a structural change can be seen in the declining share of employment accounted for by occupations directly involved with production in the U.S., and the corresponding increase in the share of employment represented by non-production jobs, like sales and marketing.

However, the full extent of structural changes will not be apparent in the employment share data because many structural changes alter the tasks performed in an occupation without changing the number of persons employed in that occupation. For example, the renewed emphasis upon quality in business today is not fully reflected in the employment share data because attention to quality is a component of every occupation. The rising share of employment accounted for by quality managers does not capture this fact. Consequently, this paper uses both employment share data and reviews studies of structural changes to assess the implications of these changes for business and marketing program graduates.

The paper is divided into three chapters. The demand for business and marketing graduates is covered in chapter one. The first section of the demand analysis reviews studies of four structural changes in the economy: 1) the shift to a service dominated economy, 2) the rapid development of information technologies, 3) the changes in business organization to achieve greater flexibility and produce higher quality, and 4) the growth of employer provided training. Section two of the demand analysis looks at the employment share data for the U.S. and Wisconsin. This section also contains employment data for business and marketing occupations and industries. Industry data is provided at the two and three digit Standard Industrial Classification (SIC) level. Section two of the demand analysis concludes with employment data reported by occupation within industry categories and by industry within occupation. These data provide a detailed picture of employment prospects for business and marketing graduates.

The supply of business and marketing graduates is covered in chapter two. In particular, this chapter discusses two demographic changes that will affect the business and marketing student population. First, female labor force participation rates have been steadily increasing and are approaching male participation rates for some age groups. Second, the labor force is growing older because the number of new workers entering the labor force each year is decreasing. Since the typical business and marketing student is a young female, these changes have important ramifications for program planners.

Chapter three of the paper summarizes the findings of the demand and supply analyses and draws implications for business and marketing education from these findings.

Chapter 1: DEMAND FOR BUSINESS AND MARKETING STUDENTS

Section I: STRUCTURAL CHANGES IN DEMAND

Four structural changes that have implications for business and marketing education are reviewed in section one. Part one of the section reviews the implications of the shift to a service dominated economy.[1] Evidence of the increasing share of services in the U.S. economy can be seen in both the industry employment data and the occupational data. Part two of the section analyzes the effects of information technologies on employment skills. Recent studies have found that information technologies can be used to enhance or diminish the skills needed for business and marketing occupations. The net effect on skills is sensitive to management style and organizational structure. Part three reviews the trend in business toward flatter, more flexible organizational structures that emphasize quality and market responsiveness. Flexible organizational structures are shown to be closely related to the adoption of information technologies. Part four analyzes the relationship between public and employer provided business and marketing education. Public business and marketing education is placed in a skill life-cycle that identifies product advances as potential signals for market sensitive post-secondary public schools. Part five summarizes the effects of the above four structural changes.

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[1] For a more thorough analysis of the implications of the shift to a service dominated economy see Cotter 1987b.

1 A SERVICE DOMINATED ECONOMY

For nearly 200 years U.S. labor markets followed a familiar pattern: employment in agriculture steadily decreased while employment in the manufacturing sector of the economy increased. Today jobs in agriculture are still disappearing, but employment growth in manufacturing has come to a standstill. Virtually all new jobs created in the next decade will be in the service industries (Riche 1988). The movement from a manufacturing to a service economy signals a fundamental qualitative change in the type of output that the majority of the U.S. population produces. The first part of this section reviews the dimensions of the shift to a service economy. Particular attention is paid to the relationship between growing employment in the service producing industries and increases in the proportion of service occupations within goods producing industries. Part two of this section looks at the implications of service sector growth for rural employment.

1.1 Dimensions of the Shift to Service Occupations

Service occupations comprise a heterogeneous group containing both highly paid occupations and low skill, entry-level positions. Consequently, the popular image of low wage, low skill, dead-end service occupations is misleading.[1] Sales and administrative support jobs are considered service occupations in the labor statistics, as are fast-food preparation positions. Business services industries include both advertising firms, which employ many skilled persons, and photocopy establishments, where lower skill levels are required.[1]

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[1] "We can't afford t become a nation of video arcades, drive-in banks, and McDonald's hamburger stands." (Lee Iacocca,

Service industry jobs accounted for the vast majority of new employment over the last decade. Nineteen of the twenty million new jobs added to the U.S. economy during the last 10 years were in the service sector (Riche 1988). Of the 18 million new jobs projected nationally for the year 2000, 16.6 million are in service producing industries.(Silvestri and Lukasiewicz 1989). In Wisconsin, 247,600 new service producing jobs were created from 1978 to 1987. In contrast, Wisconsin lost 55,000 goods producing jobs over the same period. An additional 410,200 service producing jobs are projected in Wisconsin for the year 2000 (DILHR 1989).

Among the most dynamic service industries are those that employ business and marketing program graduates. The most rapidly growing industry to the year 2000 is expected to be computer and data processing services, an industry that employs many highly skilled persons. Virtually all of the business services industries are projected to have very rapid employment and output growth, much

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1983, *Milwaukee Journal*, 27 January 1984, in Cotter 1987b). "The country can't condemn its youth to a livelihood of sweeping up behind and army of Japanese-built robots." (Walter Mondale, Ibid.).

[1] Business services industry is reviewed in detail in section II.4 of the demand analysis.

faster than the projected increases in overall employment or GNP (Personick 1987).

The shift to a service economy is not just taking place across industries, although this is the context in which the discussion is usually framed. While the service *industries* have been growing rapidly,a proportionally larger change can be observed across *occupations* within the manufacturing sector of the economy. At Westinghouse Electric Corporation, for example, service related occupations now account for 73 percent of the workforce, up from 46 percent two decades ago (*Business Week*, October 10, 1988).

Between 1959 and 1984 the service industries' share of total U.S. employment rose from 60 percent to 72 percent. At the same time, within manufacturing, the proportion of non-production workers nearly doubled, from 18 percent of total manufacturing employment in 1950 to 33 percent in 1984 (Osterman 1986). Hence, it is not just growth of the service industries which is driving the observed increases in service occupations. Service employment is also increasing within goods producing industries.

Table 1 presents data on the proportion of non-production versus production jobs in durable and nondurable goods manufacturing industries for 1986 and 2000. The proportion of persons employed in managerial, professional, technical, and marketing and sales positions is projected to increase in both durable and nondurable manufacturing industries. Administrative support, clerical positions are expected to decrease as a proportion of total manufacturing employment because of more widespread and efficient use of information technologies. While precision production positions are expected to increase as a proportion of total manufacturing employment, the largest broadly defined category of production jobs, other production type jobs, is projected to decrease as a proportion of total manufacturing employment. On balance, non-production jobs are projected to increase, while production jobs are projected to decrease as a proportion of total manufacturing employment.

Table 1

Percent Distribution of Production and Non-Production Jobs in Durable and Nondurable Goods Manufacturing United States: 1986 and Projected 2000

	Percent of employment			
	Durables		Nondurables	
	1986	2000	1986	2000
All manufacturing occupations	100.0%	100.0%	100.0%	100.0%
Non-production	33.4	35.9	29.5	31.5
Managerial, professional, technical	19.9	23.4	12.8	14.7
Marketing and sales	2.2	2.3	4.1	4.6
Administrative support, clerical	11.3	10.2	12.6	12.2
Production	58.3	56.1	62.1	60.4
Precision production	11.0	11.2	6.6	6.8
Other production type jobs*	47.3	44.9	55.5	53.6

* Mechanics, machine operators, hand assemblers, material movers, laborers.
SOURCE: Personick (1987) p.33.

Increases in the non-production share of labor at the firm level may be an indication of the rising importance of the administration, marketing and distribution functions that these workers provide (Subramanian 1987). Service industry growth is indicative of increasing non-production specialization, made possible by improvements in information technology.

1.2 Service Employment in Rural Areas

The relationship between business and marketing service occupations and goods production raises important questions about the independence of service occupations. Specifically, can service occupations grow independently of goods production, and how does the interdependence between goods and services influence the location and growth of service employment? Does the connection between service occupations and goods production put rural areas at a disadvantage in attracting service occupations? The answers to these questions are key to understanding the prospects for service employment growth in rural areas.

Service employment growth in rural areas appears to be closely linked to output growth in the manufacturing sector (Miller and Bluestone 1988). This connection stems from the fact that service occupations typically provide control, distribution, marketing, research, and support functions for production activities. Cotter (1986), in her survey of the service export literature, found that services are important elements in the economic base of regions that contain the central administrative offices of manufacturing businesses.

Over the period 1969 to 1984, national employment data show that nonmetropolitan service employment expanded more slowly than metropolitan service employment. However, during 1969-1976 service employment growth in rural areas exceeded that in urban areas. The slowdown in rural service employment growth shows up in the latter part of the data series. After 1976, service employment growth in nonmetropolitan areas drops sharply, and it increases sharply in metropolitan areas. In 1984, 7 of 8 service jobs were located in metropolitan areas (Henry et al 1987).

This pattern is similar to the employment record in manufacturing. Employment in goods-producing industries increased in nonmetropolitan areas during 1969-1976, but decreased after that. Goods-producing jobs declined in urban areas prior to 1976, but recovered strongly after that. The differing patterns of goods-producing employment in metropolitan and nonmetropolitan areas appears to have been a factor in their contrasting records of service employment growth.

Henry et al (1987) argue that most rural communities are poorly positioned to benefit from the U.S. economy's shift to services. The types of service employment that are increasing most rapidly, like business services, computer and data processing services, and temporary help services, are most profitable where there is a concentrated client population. These services are not likely to locate in rural areas where clients are fewer and more dispersed.

Miller and Bluestone (1988) cite three strategies for improving service employment growth in rural areas. They recommend strengthening goods-producing businesses in rural areas, improving the links between urban goods productions and rural labor, and developing the export capabilities of rural service businesses. Wisconsin has been particularly successful as an exporter of services. Smith and Pulver, (1984, 1981, in Miller and Bluestone 1988) in their survey of 385 non-manufacturing Wisconsin businesses, found a significant amount of exporting activity. Several studies have documented strong service export capacity in transportation services and trade (Cotter 1986). Exports of these services are related to tourism and recreation activities and to business travel. Communications, utilities, finance, real estate, business services, and personal services have less export potential, although the export potential of these industries will increase as data communication technologies improve and become more widely adopted.

In summary, the employment data show a clear connection between production activities and service industries. Rural areas that lack a strong manufacturing base are unlikely to see substantial growth in service employment unless they are able to develop and/or attract services with export potential. The export capacity of service industries like finance, insurance, and retail trade is dependent upon voice and data communications capabilities and transportation services. Lands End and Swiss Colony are two examples Wisconsin retailers that have effectively used telecommunication and transportation services to reach national markets from rural communities.

1.3 Summary of Service Employment

Overall, the evidence shows that a service dominated economy will demand greater numbers of employees with business and marketing skills because the shift to a service economy reflects the growing relative importance of non-production occupations. Since the share of non-production employment in goods producing industries is increasing, many business and marketing program graduates will find employment in service occupations that support production activities. At the same time, employment in the service producing industries is growing. Employment in Wisconsin service producing industries increased 20.0 percent over the past decade and is projected to increase 27.6 percent by the year 2000 (DIHLR 1989). Business services is the most rapidly growing industry in Wisconsin.

Many service occupations that provide production support will not be found within the goods producing business itself or they may involve a nontraditional employment structure. For example, business services firms will hire an increasing number of business and marketing graduates. Employment growth in this industry is largely being driven by expansion of the temporary help industry.

Temporary employees generally do not receive the same benefits, incentives or job security as permanent employees. As a result, they must be prepared to coordinate and manage their own benefit programs, motivate themselves to improve their employment skills, and be prepared to find new employment with little advance notice.

The service employment prospects of rural areas will depend on an ability to forge links with manufacturing and to export services. Tourism and recreation occupations are important export oriented service occupations. Telecommunications capabilities will be important to the export capacity of finance, insurance, and retail trade.

2 INFORMATION TECHNOLOGIES AND EMPLOYMENT

Information technologies comprise a set of technologies connected with the storage, retrieval, analysis, graphic manipulation, and transmission of information. Information technologies are centered around the ability of the computer to transform information into a simple binary code, making it possible to work with previously unmanageable amounts of data. Electronic information may take the form of databases, graphic images, messages, or structured decision sequences.

Information technologies are an essential tool for business and marketing employees because they enhance workers' abilities to capture, analyze and synthesize information. Improved information helps to create better decisions. Skillful use of information technologies will add value to workplace decisions.

2.1 Overview of Information Technologies

The use of information technologies in modern offices and among retail and wholesale distributors is growing rapidly. Between 1980 and 1989, the share of office machinery in the total U.S. stock of capital equipment climbed from 3 percent to 18 percent (*The Economist*, March 3 1990b). Four groups of information technologies are important to business and marketing educators: 1) communication technologies, 2) database technologies, 3) decision-oriented technologies, and 4) document technologies. The following provides an overview of some of the specific technologies within each group.

2.1.1 Communication Technologies

Communication technologies are connected with the movement of information across space and time. Important electronic communication technologies include electronic mail, voice-messaging, videotex, and computer networks. Electronic mail (Email) is a system in which messages can be entered into a computer and electronically mailed to another computer user. Email is being widely used as an office communication tool. It offers several advantages over memoranda and letters. First, for people who have a computer at their desk, Email is as convenient to use as the telephone. Second, Email is much faster than conventional mail. Messages are delivered moments after they are sent, not days. Finally, Email eliminates the need to produce multiple copies of memoranda for members of a work group or office. Email systems can be instructed to send the same message to all members of a group.

Voice-messaging systems are essentially sophisticated answering machines. Like answering machines, the systems respond to a telephone call with a recorded message providing instructions for the caller. One application of voice-messaging systems is as an internal answering machine to reduce the need for receptionists to handle intraoffice telephone calls. A second application for voice-messaging systems is as an interface to a computer system. In this configuration, the systems are set up to respond to external telephone calls with instructions that provide access to a computer database. For example, many banks now offer voice-message system access to account information. Callers can respond to recorded instructions to retrieve balance information, to transfer funds or to by-pass the computer system and speak directly to a service representative. The University of Wisconsin uses a voice-message system to register students. These systems enhance business productivity by letting the customer access the computer directly, rather than through an employee. The systems potentially reduce the need for transactions processing employees.

Videotex is a generic term used to describe communications systems which enable users to receive and display graphics and textual information on a television screen. Videotex can be a two-way system in which the user is able to send messages back to the computer generating the images. This is known as interactive videotex. However, in most systems in use today, the user may only choose what information to view, much like a television viewer changes programs. This type of videotex is known as broadcast videotex, or teletext.

Videotex has important applications in advertising, merchandising and marketing. In areas like customer services, and for industries such as recreation and tourism and real estate services broadcast videotex provides an effective alternative to posters, brochures, pamphlets, and other printed media. For example, Sears has installed videotex systems in some of its hardware departments to provide simple instructions in home repair. Recreation and tourism and real estate services use videotex to present realistic images of resorts, homes, and apartments.

Broadcast videotex can increase both the productivity and quality of customer service. The videotex maps that Cub Foods uses reduce the need for employees to direct customers in the store.

Further, customers do not have to search for an employee; the videotex machine is always in the same location.

Interactive videotex systems do not yet have widespread application in the U.S., although they could be developed through the telephone system. France has a telephone based interactive videotex system known as Minitel. The French national telephone company distributed video monitors to its customers at no charge to establish a large market for the system. Customers are then charged for using the system. Minitel can be used to access computer databases. For example, the system contains an electronic yellow pages for the entire nation and library card catalogs. The system has received an enthusiastic response in France.

Development of a comparable system in the U.S. is hampered by the limitations imposed on the telephone system by the AT & T divestiture. Local telephone service in the U.S. is now provided by seven regional firms. A successful interactive videotex system would probably have to be national in scope, requiring a cooperative effort by these firms. Further, the firms are legally restricted from providing the images that would be displayed on an interactive system. The regional telephone firms are limited to providing the system through which the images are transmitted.[1] This restriction limits the profitability of a Minitel-like system for U.S. phone companies.

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[1] The AT & T divestiture agreement allows that these restrictions may be lifted if the Court determines that the market is sufficiently competitive.

Another promising application for interactive videotex is in electronic catalogs. Electronic catalogs would allow shoppers to view products on cable television in their homes and enter purchase information through the system directly to the merchandiser. These systems could offer advantages over direct-mail marketing techniques. The development of electronic catalogs has been delayed because current cable television installations do not allow two-way communication. Electronic catalogs are not likely to be developed through telephone-based interactive videotex because the data limitations of the present telephone network would severely restrict image quality.

Some retailers are moving ahead with interactive videotex catalogs despite these difficulties. J.C. Penney, the U.S.'s fourth largest retailer, has installed an interactive videotex system in 1,100 of its stores (*The Economist*, February 24, 1990b). The company is using the system to reduce the time needed to respond to new fashion trends. When the company hears about some fast-selling sweaters in Italy, for example, it transmits a picture of the garment to its manufacturers in South Korea where an imitation is produced within a few days. Pictures of the imitation version are then sent to Penney's stores in the U.S., where shoppers can view them and send orders directly back to South Korea.

Information technology networks connect people across multiple locations. The telephone system is an ubiquitous example of a information technology network. Although most people think of the telephone as an instrument for voice communication, the most rapidly growing portion of telephone system traffic is data communication. Some industry experts believe that data will be the predominant form of transmission on the telephone system within the next decade.

The current telephone system is not a satisfactory tool for many data communication needs because data are transmitted too slowly. Specialized data networks, like Local Area Networks (LANs), are able to transmit at much higher speeds. LANs provide high-speed data transmission, usually in an office or office complex, although LANs sometimes connect computers located throughout the country. LANs generally link personal computers, although mini and mainframes can also be included in the network. LANs allows network members to share files stored on a host computer known as the file server. Only the files stored on the file server may be shared. Files stored at the personal computer "nodes" of the network can only be accessed from each node.

Data communication networks make it easier for computer users to work together on projects because they eliminate the need to carry or mail floppy disks from one office to another. By improving coordination and increasing access to information, they can improve the productivity of business and marketing occupations. Westinghouse credits information technologies like electronic mail and voice-messaging with raising the productivity of its business and marketing occupations by about 2 percent per year since the early 1980's (*Business Week*, October 10, 1988).

Data communication networks have been growing rapidly. The number of business computers connected to networks increased by 96 percent in 1986 and 102 percent in 1987 (COMTECH 1988). McDonald's has a world-wide data network which transmits sales information to a central location for processing and analysis. Green Giant has announced plans to connect all of its food processing plants with a nation-wide LAN.[1]

2.1.2 Educational Implications of Communication Technologies

Business and marketing students should understand the basics of electronic communication technologies. These include an understanding of the terminology used and how to operate and troubleshoot a data communication system. Students should understand the relationship between transmission speed and errors, the difference between analog and digital transmission technologies, and the use of error correction protocols. An ability to set up the software used for data communication over the telephone system will be an important business and marketing skill.

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[1] Presentation by Steve Baldwin, plant manager for Green Giant in Mayville, Wisconsin, at Wisconsin Power and Light's "Wisconsin Food Processors: Issues for the 1990's" conference held February 26, 1990.

Communication networks are reducing the need to place workers and work groups in the same physical location. As discussed in section 1.1 above, data communication makes it possible for providers of services to urban employers to locate in rural areas and take advantage of lower building and labor costs. Data communication capabilities are also behind the development of telecommuting as an accepted employment structure. Industry experts estimate that about five million workers will telecommute by the mid-1990's, up from 20,000 today (*Business Week*, October 10, 1988).

Distributed work group structures require increased written and verbal communication skills and an ability to work independently on one piece of a larger project. Since workers do not have immediate contact with one another, communication must be precise and to-the-point. Employees will need to be able to coordinate tasks and schedules through written systems like E-mail and verbal systems like voice-messaging. They will need to be able to access, update, and return shared files to a LAN host computer.

Videotex is a new communications medium with important applications for marketing and sales. Students in these fields should have an understanding of the limitations and possibilities for videotex as a marketing tool. They will need to learn how to present a client's message effectively in that medium. Since the technology is developing rapidly, attention should be paid to future trends in videotex.

2.1.3 Database Technologies

Database technologies were one of the first applications for computers in business and marketing, and they are the most widespread application in use today. Customer records, airline schedules, stock inventories, accounts receivable, and hotel reservations are all examples of information that is regularly stored in a database.

A database is simply an organized collection of data. For most computers, data is anything that can be recorded as text, a number, a date, a picture, or a yes/no distinction. Some examples of data are a name, an address, a telephone number, the price of an item, a salesperson's commission, the number of items in an inventory, the abstract of an article, a picture of a house that is for sale, and so on. A database management system (DBMS) is a group of related computer programs which enable the user to manipulate a database. Database management includes:

- Entering and storing large amounts of information in an organized fashion for later retrieval or manipulation;
- Modifying the information recorded in the database;
- Sorting entries in the database by one or more elements of each record; for example, a mailing list could be sorted by first letter of the last name and zip code;
- Retrieving entries on the basis of specified characteristics; for example, airline reservation workers could retrieve information on all flights from Milwaukee to Washington leaving after 10 a.m. on a Monday that involve no more than one change of planes;

- Producing summary statistics of the information in the database; for example, an insurance company could determine how many of its automobile policy holders were involved in accidents in the past year.
- Formatting and displaying selected pieces of the database or summary statistics; for example, a stockbroker could produce a monthly report of transactions for each client.

Database technologies are constantly being improved. Early database applications were almost exclusively developed for mainframe and minicomputers. However, contemporary personal computers are powerful enough to handle the database requirements of most small businesses, and sophisticated DBMS software is available for these machines. As a result, businesses today are using personal computers for many of their database needs. The movement toward personal computer database systems is likely to continue. Personal computer DBMS software is generally easier to use than the mainframe software and is considerably less expensive.

A second direction of development is toward increased integration of information sources. Databases are being integrated to provide more comprehensive management control over information systems. For example, inventory control systems use database technologies to turn inventory and sales data into a competitive asset. Just-In-Time (JIT) inventory techniques rely on careful tracking of inventory stocks, work-in-progress and sales to maintain inventories at minimum levels. JIT techniques can reduce working capital requirements and increase profitability. Electronic point-of-sale devices like electronic cash registers, credit card readers, and electronic scanners directly connect sales to credit and inventory databases. Scanners are having the widest impact at retail establishments that sell commodity products like stationery and groceries (*The Economist*, February 24, 1990b) The universal product codes used in grocery stores make it possible to update inventories in real-time as sales take place. The information from these systems allows management to better track the performance of products and helps them to be smarter, swifter innovators. Cub Foods has installed devices which allow customers to pay for purchases with a bank automatic teller machine (ATM) card. The ATM purchases eliminate risks associated with checks and improve cash flow.

Management experts like Tom Peters argue that the most important future applications of database technologies will be in the areas of marketing research and sales. Peters believes that firms should create extensive databases of customer information and market their products to narrowly defined groups. He claims that the 1990s will be the decade of one-to-one, instead of niche, marketing (*The Economist*, February 17, 1990). Detailed databases make this degree of personalization possible.

Some companies have already moved in this direction. Kimberly-Clark spent $10 million out of a $35 million launch-marketing budget for a new disposable diaper on locating three-quarters of 1989's new mothers (*The Economist*, February 17, 1990). The company used its database to send direct-mail advertisements to the new mothers. Porsche market researchers used a database with the names of

America's 80 million car-owners to identify 300,000 people most likely to purchase a Porsche. Each of the 300,000 will receive a personalized letter inviting them to test-drive a Porsche (*The Economist*, February 10, 1990). Traditional mass marketers like Proctor and Gamble have begun to advertise extensively through "micro-marketing" vendors like Whittle Communications (*Business Week*, August 28, 1989).

Whittle Communications presents its client's messages to potential customers through posters mounted in junior highs and high schools and "waiting room" magazines specially created for doctors and dentists. It has a television news program complete with commercials that is broadcast to high schools during homeroom. Proctor and Gamble is able to develop ads promoting its products in terms appropriate for a specific market segment, and thereby improve the effectiveness of its advertising dollar.

On-line and compact disk (CD) database services are an increasingly valuable resource for market researchers. On-line databases can be accessed with a personal computer through the telephone. CD databases use the same technology as audio CDs. One CD can hold as much as 200,000 pages of single-spaced text.

Researchers can get information about competitors from on-line databases like Compustat, which contains data from the 10-K filings that every company listed on a stock exchange must file with the Securities and Exchange Commission. Databases such as Nexis contain abstracts from magazine and newspaper articles, making it possible to search for information about new product introductions or expansion plans. Legal databases like Lexis and Westlaw function as an alternative to a traditional legal library. Researchers can also purchase access to industry survey data. COMTECH surveys more than 3,000 businesses across the U.S. each year concerning their use of information technologies. From this database a researcher could learn, for example, that the Rocky Mountain area is the only region of the country where more businesses use Apple computers than IBM compatible products.

2.1.4 Educational Implications of Database Technologies

There are a wide variety of DBMS packages for mainframes, minicomputers, and personal computers available on the market today. Moreover, many businesses have developed specialized database systems to meet their needs. Because of this diversity, a good educational program should focus on the general characteristics of DBMS software and database structures and expose students to several DBMS software packages. However, students should do most of their work on an industry-standard DBMS package to develop mastery and in-depth technical skills on a widely used database system. A sound foundation in database methods will enable students to swiftly learn systems used in the workplace and to adapt to advances in database technologies.

At a minimum, students should understand the capabilities and limitations of databases for information storage, retrieval, manipulation, and presentation. For example, students should learn how to use billing databases to create marketing and sales information. They should be able to access on-line databases and to download information for further analysis. An awareness of the databases that are available for market research will enhance students' abilities to add value in a competitive market.

Paralegals (legal assistant) will require training on the Lexis and Westlaw legal research systems and on CD database systems. Lexis and Westlaw are primarily on-line databases today, although both firms are working to move their databases to a CD format (Eidelman 1990). The limited CD services now available for legal research are just the beginning, and during the next several years, most statutes, cases, form books, and other materials will be available on CD. Paralegals (legal assistants) should learn about "hypertext" searching, a feature of many CD databases. Hypertext allows researchers to perform "stream-of-consciousness" searches.

2.1.5 Decision-Oriented Technologies

Decision-oriented information technologies use a database to create new knowledge by synthesizing and analyzing information. Some examples of decision applications include spreadsheets, statistics packages, charting software, project scheduling software, and expert systems.

Spreadsheets are used on personal computers in virtually every modern business for financial analyses. The software contains programs for calculating present discounted values, internal rates of return, growth rates, trend lines, and so on. Most spreadsheet packages contain an ability to chart and graph data from the spreadsheet. Visual representations of data like charts and graphs can be used to highlight trends and improve the quality of presentations.

Project scheduling software is used to solve complex scheduling problems. The programs keep track of critical schedule dates and supplier requirements. Project scheduling software is widely used in the construction industry to manage crew assignments and avoid scheduling conflicts between suppliers.

Statistics software is commonly used by market researchers. The software is used to analyze databases created from customer surveys, internal account information, on-line data, and other sources. Statistical analyses are an essential component of niche marketing strategies, since they are used to find the most profitable market niches and to identify customer characteristics for use in advertising campaigns.

The capabilities of personal computer based statistics packages have expanded dramatically in recent years. The current generation of personal computer packages are able to perform all but the most advanced statistical analyses. The only practical limitation on the current personal computer software is the size of the database that can be analyzed. Personal computer based statistics software is generally easier to operate than the mainframe software. Consequently, use of statistical techniques has been increasing in business.

An advanced decision technology which is just beginning to have practical business applications is expert systems Expert software packages emulate the decision process.of human experts. The programs are designed to analyze information and choose among several alternative decisions. Expert systems make real decisions. In this respect they represent a significant step beyond the capabilities of spreadsheets and other decision technologies. Spreadsheets and statistical software analyze information, but they leave all decisions to the human operator.

For the past year, American Express has used an expert system called the Authoriser's Assistant to authorize exceptionally large credit card purchases. Because American Express has no fixed limit on its credit cards, it requires shops to get specific approval for unusually large charges. In the past, this was a time consuming, labor intensive and error prone process. Today, a computer "expert" automatically approves the simplest third of requests for credit, and summarizes the relevant issues for human authorizers on the rest. Freed of the most routine requests, authorizers are able to focus their attention and exercise more careful judgement on the difficult cases. As a result, the fraction of approved charges ending up as bad debts has been reduced by one half (*The Economist*, February 11, 1989).

Several brokerage houses now use expert systems to suggest stock purchases and sales (*The Economist*,February 11, 1989). Some large construction firms have begun to use expert systems to suggest ways to cut costs on over-budget projects and to identify risks associated with fixed bid projects (Harris-Stewart 1988).

2.1.6 Educational Implications of Decision Technologies

Decision technologies enhance a decision-maker's ability to capture, analyze, and synthesize knowledge. With the exception of expert systems, decision technologies do not make decisions. A key skill for business and marketing students is the ability to effectively incorporate analyses from these technologies to add value to business decisions.

All business and marketing students should learn basic spreadsheet techniques and methods. Students should get practice on two or three software packages, with in-depth work on one, so that they understand the strengths and weaknesses of the different approaches and are prepared to rapidly learn the software used on the job.

Marketing students should be given a solid foundation in statistical techniques and exposure to the use of personal computer statistics software for marketing research. Real estate and construction management students should understand how to use project scheduling software to manage large building projects. They should also be aware of the trends in the use of expert systems in the construction industry.

2.1.7 Document Technologies

Document technologies are concerned with the preparation and presentation of information. The basic document technologies are word processing and graphics. There have been enormous advances in the personal computer software available for both of these fields in recent years. The capabilities of graphics and word processing systems have increased tremendously. The systems have more functions and are able to work with larger, more complex documents than previously, and the two technologies are being merged in complete document creation packages, such as desktop publishing systems (DTP). DTP is providing businesses with an in-house capability to produce publication quality pamphlets, brochures, flyers, manuals, and so on. Document assembly packages add decision-making capabilities to word processing. These systems can automate the preparation of standard documents and are used in industries like legal services (Keeva 1990).

The text editing features of word processing software packages are approaching those found on commercial publication computer systems. The systems provide a variety of fonts, type sizes, and formats. They have sophisticated editing features that can automatically create indexes and tables of contents. The systems check spelling and hyphenate words and sometimes come with an electronic thesaurus.

Graphics systems have become more powerful and easier to use. Sophisticated graphics software packages are available for personal computers at reasonable costs. Most graphics applications now use a computer mouse as an interface, greatly improving the user's ability to create images. The mouse is connected to electronic painting and drawing tools like airbrushes and pens for drawing computer images. Optical scanners can load photographs to a computer graphics package for retouching work or so that text or another picture can be pasted into the photograph. Graphics systems can produce color slides for use in a slide projector or on an overhead machine.

2.1.9 Educational Implications of Document Technologies

The increased capabilities and flexibility of document technologies are changing the skills needed for traditional office support occupations. While keyboard skills remain essential to effective computer operation, word processing and graphics software and DTP systems are reducing the relative importance of typing skills and increasing the need for document design skills. Advances in document technologies make in-house design and production of advertising and sales materials cost effective. Page layout and composition skills are vital to the visual appeal of these documents. Administrative assistants should be able to organize fonts, formats, type sizes and styles, and incorporate graphics in documents to create an attractive, persuasive document.

Administrative assistants will be the focal point for large document creation projects. They will need to be able to coordinate writers and graphics specialists and to ensure that the fonts and styles chosen complement each other. These tasks will require increased communication and organization skills and continued emphasis upon editing skills.

Paralegals (legal assistants) will have increased responsibility for drafting complex documents. Document assembly packages simplify the creation of standard legal documents so that more documents are within the skills of paralegals.

2.1.9 General Implications of Information Technologies for Education

Much of the work done in business and marketing occupations involves the handling of information, not physical objects. Here, electronic data processing equipment is replacing "paper work" to keep track of customers, products, inventories, financial records, schedules, reservations, and competitors. Advances in communication media are changing the way products are promoted and sold. Virtually every worker in wholesale and retail sales, advertising and marketing, transportation, administration, accounting, recreation and tourism, and other activities involving the provision of goods and services will find his or her job affected by information technologies.

Computer technology changes so fast that the most valuable computer skill will be the ability to learn new systems easily and quickly. Students will need to be able to adjust to a new set of symbols displayed on the screen, a different sequence of words to be typed, or a modified control panel. Broad experience with automated office procedures, with the operation of computer-controlled devices, and with the limitations of computers in general will provide a solid background for business and marketing students. A general understanding for the way computer programs are structured and hardware systems are constructed will increase student's flexibility. Programming will not be necessary for most occupations, but an understanding of the principles of programming will help computer users understand the limits and possibilities of computer systems and encourage effective use of the system.

Basic machine literacy is another key skill for information technology users. Students must possess an understanding of the context within which all electronic and electro-mechanical devices function. This knowledge should prepare students to perform simple maintenance and troubleshooting operations. For example, when a computer is turned on and the screen fails to light up, the student should be able to follow a check-out sequence to determine which part of the system is malfunctioning.

Students should be presented with two or three hardware and software configurations for most applications. Computer users should be aware that there are a many approaches to each problem and that no one program can meet all their needs. Exposure to a few hardware and software configurations will help students to appreciate the different computer systems that are available and permit them to generalize about common characteristics. For example, accounting students might be given instruction on a personal computer system using Lotus 123 and on a mainframe using an industry-specific accounting package. In-depth instruction should focus on the industry-standard system, so that technical computer system issues do not interfere with learning advanced accounting concepts. Too much emphasis on the multitude of accounting systems that are commercially available will bog students down in the trivial details of different systems and extend students' learning curves for both computers and accounting methods.

Although information technologies are affecting virtually all business and marketing occupations, the pace of change needs to be kept in perspective. Mark (1987) notes that after 25 years of rapid growth in the use of computers, there were, in 1980, still more hand bookkeepers in the U.S than all the computer-related occupations combined. This fact does not mean that bookkeeping students do not need to learn accounting methods on computers; computer literacy is a basic skill in modern accounting. It does mean that there will continue to be a (declining) demand for pencil and paper bookkeeping skills and for traditional skills in most other occupations.

2.2 Employment Effects of Information Technologies

Several factors interact to determine the impact of information technologies upon the number of business and marketing employees needed in the economy:

- the speed with which the innovation is adopted by firms, or its rate of diffusion;
- increases in productivity associated with the innovation, and what sector(s) of the economy captures the benefits associated with the increased productivity;
- the multiplier effects of the innovation on the economy as a whole (Cyert and Mowery 1987, p. 100).

Definitions of these terms and a general discussion of the issues connected with measuring the employment effects of new technologies are provided in Appendix A. This part of the paper reviews several studies of the effects of information technologies on the demand for business and marketing employees. The studies focus on the general employment demand effects of information technologies. They do not provide detailed employment estimates. Section II of this chapter provides a detailed review of the employment data.

Studies of the rate of diffusion of new technologies typically show slow, gradual adoption of the technology over the course of a decade or more. However, recent evidence on the diffusion of information technologies suggests a much more rapid rate of adoption (Cyert and Mowery 1987, p. 44). Mark (1987), in his review of Bureau of Labor Statistics data from the mid 1950's to the present, found that, "The pace of introduction of new technology appears to be increasing in many industries as these industries modernize to reduce costs and compete more effectively in domestic and overseas markets."

Hunt and Hunt (1986) surveyed the effects of information technologies on business and marketing employment. The authors found that previous studies on this topic had often overestimated the diffusion rates of these technologies and had exaggerated their productivity enhancements. These problems caused the earlier studies to overstate the job-displacing effects of technology on office workers:

> The forecasts of declining clerical employment are based on over-optimistic expectations of technological improvements or exaggerated productivity claims on behalf of existing technology. In our opinion, current office technology offers significant improvements in product quality and modest improvements in productivity. There is as yet no empirical evidence of an office productivity revolution that will displace significant numbers of clerical workers. (in Cyert and Mowery 1987, p.89)

The authors place considerable emphasis on the demand characteristics of the economy as a whole in their analysis. In particular, they include the effect of increasing aggregate demand in their estimates of the employment effects of information technologies.

Osterman (1986) studied the impact of information technologies on business and marketing employment across industries over the period 1972 to 1978. He found that jobs were lost among the existing group of employees, but that these losses were partially offset by an increased demand for employees skilled in tasks specific to the new technology. The net effect was a partial shifting of demand to a different occupational category. He also found that the displacement was typically followed in a few years by increases in business and marketing employment as the industry grew. The net effect of these changes was a decrease in employment in the short term, followed by an increase over a period of several years. The study does not address whether industry growth was directly related to adopting information technologies or was caused by other factors, nor does it consider new jobs created elsewhere in the organization.

Roessner, et al., (1985) present a strikingly different version of the employment effects of information technologies. They find that office employment in the financial services and insurance industries could decline by as much as 40 percent between 1980 and the year 2000 as a result of the introduction of information technologies. Their results were obtained by questioning experts on likely improvements in office technologies and applying these projections to a functional taxonomy of office tasks. Their conclusions derive from an application of estimated productivity gains to existing employment. They assumed rapid diffusion and generally ignored multiplier effects.

There is a need to be cautious in interpreting estimates of the impact of information technologies on labor demand. Given the current state of the art it is impossible to make consistently accurate predictions. Mark (1987, p.26) comments that, "Assessing the impact of technology is very complex. Technological changes interact with, and are affected by, changes in output, consumption patterns, international competition, and other factors, and the relationship between changing technology and employment is by no means clear."

2.2 Impact of Information Technologies on Skill Requirements

There is a considerable literature concerning the effects of information technologies on employment skills. Two fundamental issues are apparent. One group of authors argues that information technologies are being used to increase management control and to deskill administrative and sales occupations (Shaiken 1984). A second group argues that information technologies require increased skills and promote a flexible form of job specialization (Piore and Sabel 1984). A clear consensus has not yet emerged from case studies of the introduction of information technologies.

Part of the confusion results from the fact that information technologies' effects upon employment skills are not the same over the entire learning curve for the technology.. The skills most needed at the introduction of a technology are generally not those needed after the technology has become well-established. For example, the initial users of a new computer database system are likely to need programming skills to respond to the first system bugs, while, as work processes become more routine, later use may focus on speed and efficiency of information retrieval. These effects imply that it is important for educators to monitor technology life cycles in order to understand skill requirements.

In addition, the relationship between information technologies and skill requirements is closely connected to the firm's organizational structure and management style. The same innovation in two different firms could produce very different effects upon skill levels depending upon how work processes are organized (Adler 1984 and Spenner 1985). Consequently, individual case studies may produce very different conclusions.

Flynn (1988) analyzed almost 200 case studies of the employment effects of process innovations between 1940 and 1982 from around the world. She found that firm organizational structure was the single most important factor influencing the impact of the innovations on job skill requirements. The technologies considered were evenly split between those advancing marketing or distribution and those applied to the office environment. Her review shows that new technologies were equally likely to create and eliminate jobs, and to enlarge and deskill jobs. On balance, she found that the adoption of data and word processing technologies tended to eliminate low skill and create high skill jobs, although there was considerable variation across industries and firms. She concluded that the net effect on skills depended heavily upon firm specific characteristics.

Needleman (1986) also focuses on the importance of organizational structure, but she arrives at a very different conclusion. Needleman claims that the relatively rapid diffusion of information technologies was dependent upon the presence of low wage female entrants to the work force. She argues that work processes were reorganized to reduce skill levels and to utilize lower wage employees. These new entrants to the labor force were more amenable to skill degradation, since they did not have personal experience with the prior skill level.

> In many, if not all, of the expanding job areas, new technology has been utilized to downgrade and deskill jobs, which keeps wage levels low and stressful repetition high. Opportunities to develop skills have actually been reduced....technological deskilling has enabled or encouraged many employers to replace its (*sic*) higher paid male workers with lower paid females." (Needleman 1986 p. 224)

If Needleman's version of the process of skill degradation is correct, then case studies on the effects of new technology may misstate the extent of deskilling because they interview established job holders. These established workers would have experienced little skill level change. Instead, the skill changing impact of the new technology is focused upon and limited to new (primarily female) labor force entrants.

Baran (1986) points out that the learning curve and organizational structure arguments are closely related. His research shows that the skill effects of information technologies have been different at different periods of time. He notes that many case studies in the 1970's reported that automation fragmented and routinized office work, causing a degradation in skills. More recent case studies suggest that the movement toward distributed computing and work groups has resulted in a shift back toward higher skill levels as workers are given responsibility for a broader range of tasks. Baran's evidence complements learning curve arguments concerning technology-driven productivity improvements. One aspect of the learning curve hypothesis is that new information technologies may require changes in the organization and management of work in order to achieve their full productivity potential (Porter 1985). The ways in which workers, supervisors, and managers interact may have to change at the same time as new information systems are adopted (*Business Week*, June 6, 1988). Rigid office work structures serve to limit the range of choices for good job design.

3 ORGANIZATION OF BUSINESS AND MARKETING OCCUPATIONS

Organizational structure and management style affect labor demand and employment skills. Adam Smith's observations concerning the effects of an extreme functional division of labor are still valid today:

> The man whose whole life is spent in performing a few simple operations. . .has no occasion to exert his understanding, or to exercise his invention in finding out expedients for removing difficulties which never occur. He naturally loses, therefore, the habit of such exertion, and generally becomes as stupid and ignorant as it is possible for a human creature to become. (Smith 1776 Bk. V, Ch. 1, p. 302)

Information technologies do not require a particular organizational structure. Many organizational forms are compatible with the technology. As discussed in section I.2.3 above, firm specific features such as management style and organizational structure are key factors in the effects of information technologies on employment demand and skills. Effective business and marketing education requires an understanding of the trends in organizational structure and management style.

"Taylorism" and "flexible specialization" are two alternative schemes for the organization of business and marketing occupations. Taylorism creates a strictly delineated occupational structure. Flexible specialization suggests a combination of highly specialized skills in a narrowly defined field and broad competencies in related areas (Piore and Sabel 1984).

Taylorism and flexible specialization have different implications for job skills and employment demand. Taylorism is associated with deskilling, while flexible specialization is associated with job enlargement and skill increases. Taylorist organizations have hierarchical organizational structures with many layers of management. Flexible organizations often utilize work groups and have fewer levels of management.

Early applications of information technologies generally organized work processes around Taylorist principles. However, the trend in organization today is toward more flexible structures. This section of the paper contains three parts. Part one briefly reviews the history of Taylorism as a principle of management science. Part two discusses the current trend toward flexible organizational structures. The third part of the section summarizes the implications of flexible organizational structures for business and marketing education.

3.1 History of Business Organization

Frederick Taylor built upon the concept of a division of labor at the factory level and developed it into what is generally acknowledged as the foundation of modern management science (Gill 1985, p. 64). Taylor believed that labor is most productive when each stage of the production process is identified and treated as a separate skill. In this way workers need master only a small piece of the larger production system. Henry Ford later extended Taylor's ideas by adapting the labor process to the capabilities of machines in order to further increase productivity. Taylorism and Fordism as organizational principles are most effective when output is directed toward a mass market. Their rigid functional coordination is designed to maximize the efficiency of production processes containing many repetitive tasks. Modern business organizational structures were developed Tayloristic principles. The various business and marketing functions were identified, and a bureaucratic structure was developed to coordinate those functions through narrowly defined tasks (Chandler 1962).

While Taylorism has primarily been a feature of manufacturing, some author's believed that this was only because of limitations on the technology available for routinization of the office production environment. Franco de Benetti, then managing director of Olivetti, the Italian manufacturer of office equipment, discussed the potential for introducing Taylorism into the office environment at a 1979 conference in London:

> Information technology is basically a technology of coordination and control of the labour force, the white-collar workers...In this sense EDP [electronic data processing] is in fact an organisational technology and, like the organisation of labour, has a dual function as a productive force and a control tool for capital. (Albury and Schwartz, *Partial Progress: the politics of science and technology*, London: Pluto Press (1982) in Gill (1985))

Taylorism in the office implies that work will become increasingly standardized, mechanistic and subordinated to the requirements of the technology. A Tayloristic approach to the introduction of information technologies is likely to lead to deskilling.

3.2 Trend Toward Flexible Business Organization

It appears that most businesses are using information technologies to increase their flexibility, although the movement in this direction has been fairly slow. Recent literature on business structure heralds the benefits of organizational flexibility. The title of Tom Peters new book is suggestive: *Thriving on Chaos: Handbook for a Management Revolution* . Toffler (1985) presents a good summary of current organizational thinking:

> Instead of rigid conventional departments, the firm is divided into a highly flexible structure composed of "framework" and "modules." Instead of being treated as an isolated unit, it is pictured as occupying a position at the center (and as part of) a shifting "constellation" of related companies, organizations and agencies. The result. . .is a powerful model of adaptive organization. (p. 91)

Still, according to a recent survey, the most pressing problem facing management information systems (MIS) managers is convincing their colleagues to change their business practices to take advantage of information technologies. Only about one-third of the businesses surveyed had used information technology projects to alter business practices (*The Economist*, March 3 1990b).

The perceived need for organizational flexibility originates in the rapidly changing structure of contemporary markets. Traditional corporate bureaucratic structures were designed to produce a limited range of repetitive decisions. This structure performed well in a world with the mass market mentality of American commerce in the 1950's and 1960's, relatively inflexible information systems and production technologies with long life spans.

Business organizations are under increased competitive pressure to improve their capability to respond rapidly and flexibly to changes in the marketplace. The recession in the first half of the Reagan Administration was short, but it was unusually severe. Businesses which were unable to reduce their costs in line with their decreased sales were forced out of operation. Competition in Wisconsin industries has increased. From automobiles to telecommunications, retail sales to supercomputers, accounting to natural gas, virtually all sectors of the economy report increased competition. There are many reasons for the increased competition--international competitors and deregulation are two of the most important--but the outstanding consequence is that businesses must be more responsive to changes in the marketplace.

Two important and closely related trends have followed upon increased competition. First, firms have attempted to position their products and services in relatively narrow markets, called micro-markets. Second, businesses have worked to increase the quality of their products and services. Both of these trends work to move competition away from prices toward competition along other dimensions. Competition in micro-markets is more about the appropriateness of the product or service to customers than about price. High quality products offer value, a combination of quality and price, to customers. By diminishing price competition, businesses can protect profits in a competitive marketplace.

The trends toward organizational flexibility, micro-marketing, and quality are self-reinforcing. Micro-marketing requires flexibility because micro-markets are more volatile than mass markets. Firms need to be able to leave one market and move into another when profit opportunities disappear. For example, ICL, a British computer manufacturer, makes minicomputers to order, but it could use its factory to produce washing machines if it had to (*The Economist*, March 3 1990). Quality production is also essential to micro-marketing. When products are produced in small batches, rather than large production runs, avoiding the waste associated with inferior quality becomes a critical component of costs. Further, high quality is often a defining characteristic of market niches. Flexibility also puts a premium on quality. Flexible manufacturing systems reduce the number of humans that handle parts. In so doing, they also eliminate the opportunity for human operators to spot defective parts, making it imperative that virtually all parts are within specified tolerances.

One management technique used to improve quality, statistical process control (SPC), is widely used in manufacturing and deserves special mention. SPC is a production process monitoring system which provides statistical measures of conformance to specification. SPC is valuable solely as a method to measure of quality. However, most users find that its most important contribution to the firm arises out of the communication framework which it provides. SPC cam be a common, objective language to help managers, line-supervisors and operators focus on common quality objectives (Steinpfad 1989). Jacobs (1986) found that Michigan automobile parts suppliers provided more SPC training to managers than to operators, indicating that they considered SPC an important communication tool. For parts suppliers in the automobile industry, SPC is an important component of customer service because it provides an objective communication link to the customer.

In its role as a communication facilitator, SPC is functioning as an information technology. Porter (1985) argues that information technologies are becoming an increasingly important source of competitive advantage in all industries. A Westinghouse Electric spokesperson says "People are amazed at how quickly we can move information around. It gives us a competitive edge." (*Business Week*, October 10, 1988). In service industries like banking and brokerage houses, effective users of information technologies are moving the "back office" directly into the competitive arena, thereby making administrative work more visible and more valuable (Gill 1985, p. 47). Osterman (1986) found that computers and office workers ". . .cooperate in accomplishing a function within the firm, and that as computers become more common and more powerful the function itself becomes more important and the demand for clerks [and other office workers] increases." Businesses with superior coordination of their productive resources are able to respond more rapidly to opportunities in the marketplace. Information technologies improve coordination; thus one of their effects is to increase the demand for employees with business and marketing skills.

The consensus today is that an increasing number of problems and opportunities arise that cannot be neatly matched with any one component of a Taylorist organization. Subramanian (1987) sums up the current wisdom: "To cope with changes, organizational productivity has to be increasingly governed by human creativity and managerial effectiveness. The structure will be flatter, action oriented, entrepreneurial, and, above all, flexible."

3.3 Implications of Flexible Organization

The big losers in the movement to a flatter organizational structure will be middle managers and supervisors in the largest businesses. Some management experts estimate that more than a million U.S. middle managers, staff professionals and supervisors have lost their jobs in the past decade. Over a recent 18 month period, General Electric Corporation's Medical Systems Group cut its middle management ranks by 35 percent (*Business Week*, September 12, 1988). Peter Drucker predicts that in 20 years the typical Fortune 1000 business will employ no more than a third of its current managers, with half the levels of management.

Improvements in information processing technologies are making these staff reductions possible. As business information networks become more sophisticated and widespread, the need for middle managers to assemble reports and pass them on to superiors with decision making authority is reduced. Similarly, the supervisory function of scheduling work flows is increasingly likely to be automated. Middle managers and supervisors who lack operating responsibilities and skills are the most at risk for losing their jobs . Corporate headquarters staffs could virtually disappear with the rise of sophisticated information networks that supply and analyze data. Improvements in information technologies are expected to generate personal computers that "...function like a platoon of talented assistants and middle managers, handling routine tasks automatically..." (*Business Week*, September 26, 1988). The information processing function that many middle managers fill is increasingly likely to be automated.

To date, the effects of this technology-driven decline in the demand for middle managers and supervisors is most visible in businesses with 500 or more employees. According to the U.S. Bureau of Labor Statistics, jobs for middle managers and supervisors are now most likely to be found in small businesses. In fact, small business growth from 1984 to 1987 actually resulted in a net increase in middle management and supervisory jobs nationally, from 25 million in 1984 to 26.5 million in 1987 (*Business Week*, September 26, 1988 p.76). Small business growth is projected to continue to offset reductions in the demand for middle managers and supervisors that improvements in information technologies will generate in the future. The net result of these two conflicting trends is expected to be an increase in middle management and supervisory positions (see section II.1 below). However, the information processing capabilities of computers will likely replace many of the more routine reporting and scheduling tasks of middle managers and supervisors leaving them with more operational and decision making responsibility.

A second implication of the movement toward flexible organizational structures is an increased use of contracted employees, as opposed to more traditional, internally hired employees (Mangum, Mayall and Nelson 1985). Contracted employees are provided by temporary help agencies and business services organizations. The distinctive feature of these employees is that they provide services that are vital to the operation of a business enterprise, but they are not legally employed by that enterprise. Instead, they are employed by an outside firm, and their services are then sold to the business on a contract basis.

The contractual arrangement effectively shifts the risk of employment to the contracting agency or to the employee herself. The business that actually uses the employee's services can hire and fire in an immediate response to changes in the market. There is no need to provide multiple warnings of inadequate performance or to document insufficient demand for the business's product. Contracted employment removes the burdens of legal and moral responsibility that constrain flexibility in the traditional employment package.

Although temporary help agencies and other business services organizations have been in business for more than thirty years, they now offer an ever-widening range of services and are growing rapidly (Drucker 1989, Mangum, Mayall and Nelson 1985). The image of temporary help as a clerical phenomenon is no longer accurate. For example, Mangum et al (1985) found that chemical firms employ large numbers of computer programmers and technical writers under temporary contracts; finance and insurance companies hire switchboard operators, data-entry operators, and bookkeepers.

Contracted employees provide two cost advantages over internal workers. The fringe benefits provided internal employees are generally avoided. Instead,these costs are either assumed by the contractor, or the employee provides the benefits out of her own pocket. Also, contract employees are easier to hire and fire. The employing firm does not bear the costs of the entire hiring process. Some of the interviewing and training costs are borne by the employment contractor. And the employing firm does not have to document substandard performance to fire contracted employees, since they are legally employees of the contractor.

Some authors argue that contract employees will improve productivity in the office support and maintenance functions. Productivity growth in office support and maintenance occupations has lagged behind manufacturing despite substantial investments in office capital equipment (Franke 1987, Roach 1987). Consequently, office support and maintenance now take 35 to 40 cents out of every sales dollar, as opposed to the 10 to 15 cents they required forty years ago (Drucker 1989). Drucker argues that productivity improvements in the office support and maintenance functions will come more easily if these services are removed to contractors. In-house support services have a monopoly position within the firm. They have little incentive to innovate. Successful support managers are not promoted to top management positions in the organization.

The response to poor performance by an internal support group is often to hire more personnel, whereas a contractor whose performance is inadequate would be dropped in favor of a competitor.

The advantages of temporary employees do not come without costs. Temporary employment does not create the same sense of loyalty or responsibility that arises with permanent employment. This lack of commitment tends to undermine efforts to improve overall product and service quality.

A third implication of flexible business organization is the need to consider different cost accounting methods. Companies are finding that, if they rely on traditional cost accounting methods, they are not able to justify purchases of flexible manufacturing machinery (*The Economist*, March 3 1990a). Traditional costing methods tend to underestimate the worth of flexible manufacturing systems because they do not measure the "intangible" value of flexibility properly. Intangible values of flexible manufacturing include: how better quality can boost market share; how product flexibility allows more targeted marketing; and how the ability to manufacture in smaller batches with shorter delivery times leads to increased customer satisfaction. An improved accounting system should distinguish between items that add value and those that only add cost.

4. EMPLOYER-PROVIDED EDUCATION

There is abundant evidence to suggest that employers have strong incentives to provide increased education for their employees. First, structural changes in the economy have created a labor market need for employees with specific technical skills that can be provided to businesses quickly and cost effectively. Businesses need to bring additional skills into their work force as new technologies are introduced. Second, the unusually high proportion of the labor force in the prime working ages (25-54)--evidence of the maturing baby boomers--will mean higher than normal levels of competition for middle management positions (Morrison 1987). Couple this fact with technologically driven decreases in the need for middle managers, and it is clear why many firms are concerned about losses of some of their most productive employees to companies with more room for career advancement. By redirecting career paths through appropriate training, firms can retain more of their prime age work force and minimize productivity losses. Third, the current competitive environment has led many companies to place renewed emphasis on product and service quality. For example, in its efforts to improve the quality of its products, Motorola launched an extensive education program to teach new quality skills to all of its 96,000 employees. The company also insists that its suppliers enroll in courses on quality (*Business Week*, June 6, 1988).

Employers interested in upgrading their programs can either provide education in-house, or contract for training with a second party. The cost of in-house education programs is often prohibitive (especially for smaller firms). To control these costs, many firms choose to contract with outside organizations for their employee education.

Table 2 reports the distribution of skill training for selected business and marketing occupations in 1983. About the same percentage of workers reported receiving training in school as in formal company programs. A slightly larger percentage received training in informal company programs. Just over one-third of the workers received training in some form. Formal company programs represent about one-third of the total training provided to business and marketing employees and are the most rapidly growing segment of the training market.

Table 2

Sources of Skill Training by Occupation (1983)

Occupational Group	Workers Who Took Training	School	Formal Company Programs	Informal On-the-Job Training	Other
Executive, administrative, and managerial	5,098 (47)	1,916 (18)	1,884 (17)	1,688 (16)	836 (8)
Sales	3,578 (32)	769 (7)	1,411 (13)	1,642 (15)	487 (4)
Administrative support, including clerical	5,152 (32)	1,547 (10)	1,565 (10)	2,423 (15)	392 (2)
Service workers, except private household	3,151 (25)	814 (7)	955 (8)	1,528 (12)	360 (3)
Transportation and material moving	706 (18)	84 (2)	235 (6)	376 (9)	50 (1)
Total	17,685 (35)	5,130 (12)	6,050 (12)	7,657 (14)	2,125 (5)

NOTE: All employment figures are in thousands. Percentages, which are calculated on the basis of total employment in each occupational group, appear in parentheses. Many workers reported more than one source of training, so percentages may not sum to 100.

SOURCE: Carey and Eck (1985) in Cyert and Mowery (1987).

The VTAE system currently provides a large number of businesses with employer specific training programs. In 1987-88 VTAE districts entered into 3,108 contracts to provide 3,304 special courses for business, government and others--more than a 65 percent increase in the number of contracts over the previous year. Table 3 reports the number of Business and Marketing Division contract and non-contract employer specific services provided in 1986-87 and 1987-88. Contract and non-contract growth was substantial over this period. The number of business and marketing emplover-specific contract programs delivered increased 49 percent while non-contract programs increased 32 percent.

Table 3
Business and Marketing Employer-Specific Services

District	1987-1988 Contract	1987-1988 Non-Contract	1986-1987 Contract	1986-1987 Non-Contract	Percent Change Contract	Percent Change Non-Contract
Blackhawk	29	165	15	104	93%	59%
Chippewa Valley	109	540	88	519	24%	4%
Four	19	428	10	44	90%	873%
Fox Valley	67	***	32	***	109%	***
Gateway	100	***	37	***	170%	***
Indianhead	15	47	10	51	50%	-8%
Lakeshore	53	32	42	39	26%	-18%
Mid-State	9	106	1	62	800%	71%
Milwaukee	122	1	95	***	28%	***
Moraine Park	41	18	50	26	-18%	-31%
North Central	50	***	1	***	4900%	***
Northeast	102	152	81	113	26%	35%
Southwest	***	3	***	107	***	-97%
Waukesha	52	1	52	62	0%	-98%
Western	17	***	14	***	21%	***
Total	785	1,493	528	1,127	49%	32%

These figures indicate that business and marketing programs have made strong efforts to serve the business community. Still, there is anecdotal evidence to suggest that not all of the demand for training programs is being met. Some industry leaders claim that the shortage of skilled technicians is forcing businesses to provide training internally. Howard Bellman, former secretary of the Department of Industry, Labor and Human Relations, notes the "...impressive data indicating that the very employers served by the system may take over providing vocational education." (in Wacker 1987, p.462)

The impressive growth of the business and marketing employer-specific services suggests that these services will be an increasingly important tool for meeting the demand for vocational education. These services are surely the best way to rapidly meet training needs for specific new technologies.

5 SUMMARY OF STRUCTURAL CHANGES IN DEMAND

Information technologies are contributing to change in the structure of occupations. Both the content of jobs and the number of persons employed in particular occupations is being modified by technological change. Although job titles may remain the same while innovation is taking place, the tasks performed and the occupation's relationship to the rest of the work process are likely to change. Employers will have less demand for manual dexterity and physical strength for materials handling, and more demand for cognitive and problem solving skills.

The studies reviewed above indicate that the effect of information technology on the demand for most skills is dependent upon firm specific characteristics like organizational structure. In this respect it is clear that the trend is away from routinization of office tasks toward more flexible work environments. Flexible organizational structures are typically associated with job enlargement, although the skills required for particular tasks may be diminished.

As more user friendly interfaces to the computer are developed, the education required for particular applications may decrease, although total educational requirements will increase. With complex office equipment, training is becoming more formal, continuous, and costly, but essential to keep the work force up-to-date and flexible. Improvements in software are likely to make access to information systems easier (*PC World*, May 1987). The result will be an increased emphasis on the analysis and communication of computer-generated information and a decreased emphasis on familiarity with specific computer software packages. "...the workplace of the future will place a greater premium on a strong foundation in basic skills for career advancement and for changing jobs but should not require massive investments in computer literacy for all entrants or employees."(Cyert and Mowery 1987, p.103). A few hours to a few weeks of detailed, formal training are usually sufficient for the basic computer literacy skills required by bank tellers, real estate agents, airline reservation clerks and similar occupations (*Computers in the Workplace*, p.45). Employers will prefer to hire people with the primary skills required in the occupation and provide brief in-house training. "Trainability" will continue to be a major criterion for hiring new employees and retraining currently employed or dislocated workers.

Chapter 1: DEMAND FOR BUSINESS AND MARKETING STUDENTS
Section II: EMPLOYMENT DATA

Two important types of data are available to quantify the trends in the demand for business and marketing students discussed previously in Section I of this paper. Data on industry payroll and employment are organized according to the Standard Industrial Classification (SIC) system. Occupational data are organized under the Dictionary of Occupational Titles (DOT) by OES codes. SICs classify industries at four levels of aggregation. This section of the paper looks at business and marketing employment data at the two and three digit level. Four digit SICs are the most disaggregated industry employment data that are available. The DOT uses a similar classification scheme. Most of the occupational data reported in this paper are at the three digit level. Four digits are the most disaggregated occupational data available.

Industry data can be used to determine which industries are experiencing the most rapid growth and consequently are likely to generate the most demand for VTAE Business and Marketing Division graduates. The industry data tell us where demand for graduates originates. Occupational data tell us which jobs are most in demand. By combining these two data sources, we can identify the industries that are most likely to employ a particular occupational category, and, conversely, what occupations are employed in specific industries. The two data sources, therefore, provide a comprehensive view of the demand side of the labor market.

Analysis of the SIC data pertinent to business and marketing programs is unusually difficult. Unlike other VTAE program divisions, business and marketing programs do not, in general, educate students for employment in specific industries. Rather they provide employment skills that are important features of every industry. Unfortunately, the data do not record the business and marketing function as a separate category within industries. Instead, the data limit the analysis to those industries which are especially important to the demand for graduates of business and marketing programs. Eleven two-digit SIC industries were chosen for study, and, in addition, five three-digit industries were selected for more detailed examination.[1] Clearly, Business and Marketing Division graduates find employment across the whole spectrum of industries. The data cited from these selected industries are indicative of the trends in industry development that affect business and marketing graduates, but they do not provide a complete analysis.

1 OVERVIEW: U.S. DATA

Table 4 shows employment by broadly defined industry group for 1972, 1979, 1986 and projected 2000. Over the period 1972-198, employment in the goods producing industries has been relatively constant while employment in the service producing industries has steadily increased. This trend is expected to continue to the year 2000. The proportion of total employment accounted for by service industry jobs is projected to increase from 66.6 percent in 1986 to 71.0 percent in 2000. Moreover, employment in goods producing industries is expected to continue to shift away from production and assembly-line jobs toward professional, managerial, marketing and technical occupations. This trend is not apparent in the industry data, but can be observed in the occupational statistics. In manufacturing, where total employment is projected to drop by 834,000 jobs, there will actually be an increase of 258,000 engineering, scientific and technical positions and 85,000 managerial and marketing jobs.

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[1] Three digit industries are contained as subgroupings within the two digit industry classifications.

Table 4

Employment by Major Sector 1972, 1979, 1986, 2000: U.S. Data

Sector	Employment (in thousands) 1972	1979	1986	2000*	Change 1986-2000*
Total	84,549	101,353	111,623	133,030	21,407
Goods-producing	23,688	26,463	24,681	24,678	-3
Mining	628	958	783	724	-59
Construction	3,889	4,463	4,904	5,794	890
Manufacturing	19,151	21,042	18,994	18,160	-834
Service-producing	49,846	63,018	74,363	94,478	20,115
Transportation and public utilities	4,541	5,135	5,244	5,719	475
Wholesale trade	4,113	5,204	5,735	7,266	1,531
Retail trade	11,835	14,989	17,845	22,702	4,857
Finance, insurance, and real estate	3,907	4,975	6,297	7,917	1,620
Services	12,117	16,768	22,531	32,545	10,014
Government	13,333	15,947	16,711	18,329	1,618
Agriculture	3,523	3,401	3,252	2,917	-335

* Based on the U.S. Bureau of Labor Statistics moderate projection.
SOURCE: Personick (1987).

More than 80 percent of the increase in total employment is projected to occur among wage and salary workers in wholesale trade, retail trade and services. Increases in the number of marketing, sales and service workers are expected to account for almost half of the employment gains in these three industries.

Table 5 shows the percent of total real domestic output accounted for by broadly defined industry groups. Output in the goods producing sector of the economy is expected to decline relative to the service producing sector, although the decrease in the share of real domestic output accounted for by the goods producing industries is not as large as was the decrease in the share of employment. This is due to the fact that productivity in the goods producing industries is expected to improve faster than in the service producing industries.

Table 5

Distribution and Growth of Real Domestic Output by Major Sector 1972, 1979, 1986, 2000: U.S. Data

Percent distribution.

Sector	1972	1979	1986	Projected 2000*
Total	100.0%	100.0%	100.0%	100.0%
Goods-producing	48.3	46.5	43.5	41.5
Mining	4.8	4.0	3.3	2.3
Construction	7.9	6.9	6.8	6.0
Manufacturing	35.6	35.6	33.4	33.2
Service-producing	47.9	50.0	53.1	55.1
Transportation and public utilities	8.6	9.1	8.1	8.4
Wholesale trade	4.8	4.9	5.6	5.9
Retail trade	6.6	6.7	7.4	7.5
Finance, insurance, and real estate	10.0	10.8	11.6	11.8
Services	10.8	12.0	13.8	15.41
Government	7.1	6.5	6.6	6.0
Agriculture	3.6	3.3	3.3	3.3

* Based on the U.S. Bureau of Labor Statistics moderate projection.
SOURCE: Personick (1987) p.33.

The 20 most rapidly growing industries in terms of wage and salary employment are presented in Table 6. Industries which tend to hire substantial numbers of business and marketing students are in bold face type.[1] The three digit business and marketing industries presented in this group of rapidly growing industries are all service producing industries.

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[1] Industries were identified with the help of the VTAE business and marketing program consultants.

Table 6

Top 20 Fastest Growing Three Digit SIC Industries, 1986-2000: U.S. Data

Industry	Average annual rate of change (percent)*
Computer and data processing services	**5.2%**
Outpatient facilities and health services, n.e.c.	4.6
Personnel supply services	**4.4**
Offices of health practitioners	4.4
Credit reporting and business services, n.e.c	**4.1**
Legal services	**3.8**
Nursing and personal care facilities	3.8
Research, management, and consulting services	**3.6**
Residential care	3.5
Miscellaneous publishing	3.4
Equipment rental and leasing	**3.4**
Accounting, auditing, and services, n.e.c.	**3.2**
Personal services, n.e.c.	3.1
Detective and protective services	3.1
Credit agencies and investment offices	**2.9**
Advertising	**2.9**
Services to dwellings and other buildings	2.9
Individual and miscellaneous social services	2.9
Automotive rentals, without drivers	**2.7**
Arrangement of passenger transportation	**2.6**

* Based on the U.S. Bureau of Labor Statistics moderate projection.
SOURCE: Personick (1987).

The industries with the largest projected employment gains are presented in Table 7. The industries which are most likely to hire business and marketing students are in bold face type.[1] The largest source of new employment is found in the eating and drinking places industry, where nearly 2.5 million new jobs are projected.

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[1] Industries were identified with the help of the VTAE business and marketing program consultants.

Table 7

Industries Projected to Generate the Largest Number of New Wage and Salary Jobs, 1986-2000: U.S. Data

Industry	New jobs (thousands)*
Eating and drinking places	**2,471**
Offices of health practitioners	1,375
New and repair construction	890
Nursing and personal care facilities	852
Personnel supply services	**832**
State and local government education	**784**
Machinery and equipment wholesalers	**614**
Computer and data processing services	**613**
Grocery stores	**598**
Hotels and other lodging places	**574**
Outpatient facilities and health services, n.e.c.**	547
State and local general government, n.e.c.	**546**
Research, management, and consulting services	**531**
Legal services	**522**
Credit agencies and investment offices	**499**
Credit reporting and business services, n.e.c.	**497**
Hospitals, private	481
Department stores	**386**
Real estate	**353**
Services to dwellings and other buildings	341

* Based on the U.S. Bureau of Labor Statistics moderate projection.
n.e.c. = not elsewhere classified
SOURCE: Personick (1987).

Table 8 presents national employment data by broad occupational category for 1986 and projected 2000. Employment in all of the business and marketing related occupations is projected to increase for the period. Employment for Administrative Support Workers, Including Clerical is projected to increase 11.4 percent over the period, more slowly than total employment at 19.2 percent. Employment in the goods producing and agricultural occupations is not expected to keep pace with increases in total employment.

Table 8

Employment by Broad Occupational Group, 1986 and 2000: U.S. Data

	Actual 1986		Projected 2000		Percent change
Occupation	Number	Percent	Number	Percent	1986-2000*
Total employment	111,623	100.0%	133,030	100.0%	19.2%
Executive, administrative, and managerial workers	10,583	9.5	13,616	10.2	28.7
Professional workers	13,538	12.1	17,192	12.9	27.0
Technicians and related workers	3,726	3.3	5,151	3.9	38.2
Salesworkers	12,606	11.3	16,334	12.3	29.6
Administrative support workers, including clerical	19,851	17.8	22,109	16.6	11.4
Private household workers	981	0.9	955	0.7	-2.7
Service workers, except private household workers	16,555	14.8	21,962	16.5	32.7
Precision production, craft and repair workers	13,924	12.5	15.590	11.7	12.0
Operators, fabricators, and laborers	16,300	14.6	16,724	12.6	2.6
Farming, forestry, and fishing workers	3,556	3.2	3,393	2.6	-4.6

* Based on the U.S. Bureau of Labor Statistics moderate projection.
SOURCE: Silvestri and Lukasiewicz (1987).

Employment of executive, administrative and managerial workers is expected to increase by more than 3 million jobs from 1986 to 2000 due to the ever-increasing complexity of business operations and the large employment gains in the wholesale trade and retail trade and services sectors. Employment in this occupational group is projected to grow at 2.1 percent annually, about one and one-half times the average for all occupations, 1.4 percent. 2.1 percent annual growth represents a slightly slower rate of growth than was observed in past years. Over the 1972-79 period, employment in executive, administrative, and managerial occupations grew 5.0 percent annually, almost twice as fast as total employment at 2.9 percent.

Managerial occupations are projected to grow rapidly because of growth in industries where the occupations are concentrated include insurance underwriters; property and real estate managers; and loan officers and counselors. Employment for purchasing managers; purchasing agents, except wholesale, retail, and farm products; and wholesale and retail buyers is expected to grow more slowly than the average for total employment because of computerization of purchasing tasks and more efficient purchasing methods.

The number of professional workers is expected to continue to grow more rapidly than projected total employment. Employment in engineering, computer specialty, and health professional occupations is expected to account for more than one-half of the 3.7 million new professional jobs added by the year 2000.

Employment in the technicians and related support workers category is projected to grow faster than any other major occupational group. This occupational group was also the fastest growing group from 1972-1986. Nearly half of the 1.4 million new technician jobs are projected to be for health technologists and technicians. Other industries driving the growth of employment for technicians include computer software and services and legal services.

Employment in the salesworkers group is expected to increase by 30 percent, or by 3.7 million jobs, due mainly to large employment gains in wholesale and retail trade where the sales jobs are concentrated. Demand for marketing occupations is expected to be strong due to increasing marketing activities in service industries, telecommunications, financial services, health care, and transportation industries. Employment for real estate brokers and appraisers; travel agents; and securities and financial services salesworkers is expected to increase rapidly due to strong demand in the industries where these occupations are concentrated. Salesworkers is the only broadly defined occupational group that grew as rapidly during the recessionary 1979-1986 period as it did during 1972-1979. Total employment grew one-half as fast during 1979-1986 as it did during 1972-1979.

The number of administrative support workers, including clerical is projected to increase significantly more slowly than th average for total employment from 1986 to 2000. The increasing use of information technologies is expected to cause employment to decline in several detailed occupations within this group, such as typists and word processors; stenographers; payroll and timekeeping clerks; data entry keyers,except composing; telephone central office operators; telephone directory assistance operators; procurement clerks; and statistical clerks. Other detailed occupations, such as hotel desk clerks; real estate clerks; brokerage clerks; receptionists and information clerks; interviewing clerks, except personnel and social welfare; and new account clerks in banking, are projected to grow more rapidly than the average for total employment because of rapid growth in the industries that employ them (Silvestri and Lukasiewicz 1987). Employment in computer and peripheral equipment operators is expected to be favorably affected by information technologies, and consequently employment in this occupation is expected to increase. Also employment in data entry keyers, composing is projected to increase as a result of increasing use of computerized typesetting technology.

Employment in the service workers group is expected to rise faster than the average for total employment. Five million new jobs are projected for this occupational group--more than in any other broadly defined occupational category. Most of the projected employment gain in this group is concentrated in food service and health service occupations.

The 20 fastest growing occupations from 1986-2000 are presented in Table 9. Business and marketing occupations are in bold face type. Paralegal personnel is projected to be the fastest growing detailed occupation for the period. Nearly all of the gain in this occupation is expected to be in the legal services industry where paralegals assist lawyers. Computer systems analysts, electronic data processing, computer programmers, peripheral electronic data processing equipment operators, and data entry keyers, composing are expected to be favorably affected by increasing use of information technologies. Despite more effective programming tools, continued high demand for software is expected to drive the demand for programmers. The rapid growth in the number of employment interviewers, private or public employment service is largely a result of the rapid growth of the personnel supply services industry.

Table 9

Top 20 Fastest Growing Occupations, 1986-2000: U.S. Data

Industry	Employment (thousands) 1986	Employment (thousands) 2000	Change 1986-2000* Number	Change 1986-2000* Percent
Paralegal personnel	**61**	**125**	**64**	**103.7%**
Medical assistants	132	251	119	90.4
Physical therapists	61	115	53	87.5
Physical and corrective therapy assistants and aids	36	65	29	81.6
Data processing equipment repairers	69	125	56	80.4
Home health aides	138	249	111	80.1
Podiatrists	13	23	10	77.2
Computer systems analysts, electronic data processing	**331**	**582**	**251**	**75.6**
Medical records technicians	40	70	30	75.0
Employment interviewers, private or public employment service	**75**	**129**	**54**	**71.2**
Computer programmers	**479**	**813**	**335**	**69.9**
Radiologic technologists and technicians	115	190	75	64.7
Dental hygienists	87	141	54	62.6
Dental assistants	155	244	88	57.0
Physician assistants	26	41	15	56.7
Operations and systems researchers	38	59	21	54.1
Occupational therapists	29	45	15	52.2
Peripheral electronic data processing equipment operators	**46**	**70**	**24**	**50.8**
Data entry keyers, composing	**29**	**43**	**15**	**50.8**
Optometrists	37	55	18	49.2

* Based on the U.S. Bureau of Labor Statistics moderate projection.
SOURCE: Silvestri and Lukasiewicz (1987).

2 WISCONSIN OCCUPATIONAL DATA

Table 10 contains data on employment by broad occupational group for Wisconsin for 1986 and projected 2000. Growth in the

Wisconsin economy is projected to add roughly 350,000 new jobs by the year 2000, or about 25,000 new jobs per year. An additional 77,000 new workers will be required to replace labor force separations each year. Wisconsin's projected employment growth is slightly below the national projection developed by the Bureau of Labor Statistics.

Table 10

Employment by Broad Occupational Group, 1986 and 2000: Wisconsin Data

	Employment		Change 1986-2000	
Occupation Title	Actual 1986	Projected 2000	Percent	Number
Total Employment	2,181,570	2,536,690	16.2%	355,122
Managerial and Management Related	148,220	173,690	17.2	25,467
Professional, Paraprofessional, and Technical	408,990	504,120	23.3	95,136
Sales and Related	228,470	279,830	22.4	51,363
Clerical and Administrative Support	339,440	379,080	11.7	39,640
Service	379,180	463,290	22.2	84,108
Agriculture, Forestry, and Fishing	18,760	23,680	26.2	4,916
Production, Operations, and Maintenance	658,510	713,010	8.3	54,492

SOURCE: Bureau of Labor Market Information, Department of Industry, Labor, and Human Relations, (1989).

As indicated in Table 10, the fastest growing occupational category is also the smallest, Agriculture, Forestry, and Fishing, with a projected 26 percent growth rate over the 1986-2000 period.

The largest occupational group, Production, Operations, and Maintenance, has the slowest projected growth rate, 8.3 percent. The slow growth in this occupational group is related to slow industry output growth projected for manufacturing industries and continued productivity gains in this sector.

Significant sources of new employment in the Wisconsin economy are projected for three occupational groups that employ many business and marketing graduates: Professional, Paraprofessional, and Technical; Sales and Related; and Service Occupations. These occupations all have projected growth rates in excess of 20 percent, significantly above the overall statewide average. Together, these three occupational groups will account for well over half of the new employment in Wisconsin to the year 2000.

Employment in Clerical and Administrative Support, another occupational group that employs many business and marketing graduates, is projected to grow considerably more slowly than the overall statewide average. Managerial and Management Related occupations will add 25,000 new jobs to the state by the year 2000.

Table 11 presents a more detailed look at business and marketing occupations. In the table, occupational groups are listed in order of their projected growth rates for 1986-2000.[1] Bill and Account Collectors is the most rapidly growing occupational group, with a 43.1 percent growth rate, but the occupation only employed 450 people in 1986. Computer and Related Occupations is projected to grow nearly as rapidly and will provide 6532 new jobs by the year 2000. A related occupation; Data Processing, Office Machines; is projected to be among the slowest growing occupations at 7.5 percent. The different employment prospects for these two occupational groups reflect a shift away from labor-intensive computer tasks like, key entry, toward more analytical occupations, like systems analysis and programming.

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[1] Occupational groups were selected with the help of the VTAE business and marketing program consultants.

Other rapidly growing occupations include Paralegals and Title Searchers, Underwriters, Personnel Specialists and Related Occupations, and Personal Service Occupations. The projected growth rate for business and marketing occupations is 21.5 percent, slightly above the 16.2 percent growth projected for all occupations.

The largest absolute gains in business and marketing employment are projected to occur in Commodity Sales. This occupation accounts for nearly one-third of the employment gains reported in Table 11. Other occupations which will account for large employment gains are Food and Beverage Occupations, Personal Service Occupations, and General Office Occupations.

Table 11

Projected Employment Growth for Business and Marketing Occupations, 1986-2000: Wisconsin Data

		Employment		Percent	Absolute
OES*	Occupation Title	1986	2000	Change	Change
535	Bill and account collectors	450	644	43.1%	194
251	Computer and related occupations	15278	21810	42.8%	6532
215	Personnel specialists and related occupations	6996	9928	41.9	2932
211	Underwriters	12238	16033	31.0	3795
283	Paralegals and title searchers	1512	1960	29.6	448
680	Personal service occupations	69816	90358	29.4	20542
551	Secretaries	31478	39884	26.7	8406
650	Food and beverage occupations	89674	112812	25.8	23138
490	Commodity sales workers	238266	294168	23.5	55902
430	Sales occupations, services	33632	41458	23.3	7826
539	Library assistants and bookmobile	5561	6822	22.7	1261
510	First line supervisors, clerical	6071	7430	22.4	1359
538	Travel clerks	1893	2304	21.7	411
499	All other sales and related occupations	4707	5701	21.1	994
130	Personnel, training, labor relations managers	12480	15025	20.4	2545
410	First line supervisors, sales	6992	8395	20.1	1403
199	All other managers and administrators	13987	16760	19.8	2773
531	Banking, security, finance, and credit†	38008	44026	15.8	6018
537	Court clerks	1917	2216	15.6	299
553	General office occupations	99608	114624	15.1	15016
533	Insurance adjustors, investigators	5620	6387	13.6	767
571	Communications equipment operators	4482	5052	12.7	570
573	Mail and message distribution workers	1210	1342	10.9	132
150	Postmasters and mail superintendents	15430	16847	9.2	1417
580	Material recording, scheduling, and distribution	31004	33812	9.1	2808
810	Blue collar worker supervisors	24376	26530	8.8	2154
560	Data processing, office machines	16404	17640	7.5	1236
213	Purchasing agents and buyers	7778	8084	3.9	306
	All business and marketing occupations	796868	968052	21.5	171184

* OES refers to the first three digits of the occupational code used by DILHR for each occupation.

† Includes credit analysts, loan officers, and financial analysts.

SOURCE: Bureau of Labor Market Information, Department of Industry, Labor, and Human Relations, (1989).

3 SELECTED TWO-DIGIT SIC INDUSTRIES: WISCONSIN

Table 12 presents the two-digit SIC industries which were selected as most representative of those industries in which business and marketing graduates typically find jobs. These industries represent about 25 percent of total Wisconsin private employment.

Table 12

Selected Business and Marketing Two-Digit SIC Industries

SIC	INDUSTRY
47	Transportation Services
51	Wholesale Trade--Nondurable Goods
53	General Merchandise Stores
58	Eating and Drinking Places
59	Miscellaneous Retail (Drug and Proprietary Stores,Liquor Stores and Used Merchandise Stores)
60	Banking
61	Credit Agencies other than Banks
63	Insurance
65	Real Estate
70	Hotels, Rooming Houses, Camps and other Lodging Places
73	Business Services

In Wisconsin, the total annual payroll for these selected industries grew more rapidly than did the payroll for the rest of the state's economy over the period 1975-1986. Consequently, the proportion of the total payroll accounted for by these industries increased from 14.8 percent to 17.5 percent, as indicated in Table 13. The time series data show that most of this increase occurred in the 1980's. Prior to 1980, there was a much slower rate of increase in the share of total payroll accounted for by these industries, although the trend is still visible. Annual payroll growth for the entire Wisconsin economy averaged 8.1 percent per year for the period, while the selected industries' payrolls grew at an average rate of 9.6 percent per year.

Table 13

Annual Payroll: Total Private Economy and Selected Two-Digit SIC Industries*
Wisconsin: 1975-1986

YEAR	TOTAL ECONOMY	BUSINESS TWO DIGIT SICs	BUSINESS PAYROLL AS A PERCENT OF TOTAL ECONOMY PAYROLL
1975	$12,820,248	$1,900,561	14.82%
1976	$14,291,084	$2,142,197	14.99%
1977	$15,901,682	$2,383,955	14.99%
1978	$18,241,679	$2,671,562	14.65%
1979	$20,419,271	$2,952,961	14.46%
1980	$21,502,850	$3,264,304	15.18%
1981	$23,112,266	$3,553,264	15.37%
1982	$23,428,873	$3,828,994	16.34%
1983	$24,440,023	$4,047,221	16.56%
1984	$26,869,165	$4,426,129	16.47%
1985	$28,436,728	$4,922,484	17.31%
1986	$29,835,622	$5,216,728	17.48%

SOURCE: U.S Bureau of the Census, Wisconsin County Business Patterns, 1975-1986.
* See p. 80 for an explanation of the industries represented by the two-digit SIC codes.

The two-digit business industries have also experienced a long period of employment expansion, with only a small downturn during the recession year of 1983, as indicated in Table 14.. In contrast, total Wisconsin private employment declined throughout the early 1980's recession years. The industries most closely connected to Business and Marketing Division programs are relatively insensitive to recessionary employment losses. Hence, the growth in demand for business and marketing graduates is expected to slow during recessions, but demand is unlikely to decrease unless the recession is unusually deep and/or prolonged, as was the 1980-1983 recession. Employment gains in the selected two-digit industries averaged 3.04 percent annually over the period as compared to 1.99 percent for the entire state economy.

Table 14

Wage and Salary Employment: Total Private Economy and Selected Two-Digit SIC Industries* Wisconsin: 1975-1986

	TOTAL	PRIVATE	BUSINESS	SECTOR	BUSINESS SECTOR
YEAR	EMPLOYMENT	ANNUAL % CHANGE	EMPLOYMENT	ANNUAL % CHANGE	EMPLOYMENT AS A PERCENT OF TOTAL PRIVATE EMPLOYMENT
1975	1,345,446	---	306,781	---	22.80%
1976	1,381,848	2.71%	321,695	4.86%	23.28%
1977	1,430,748	3.54%	334,538	3.99%	23.38%
1978	1,557,232	8.84%	362,694	8.42%	23.29%
1979	1,628,154	4.55%	377,030	3.95%	23.16%
1980	1,610,115	-1.11%	377,533	0.13%	23.45%
1981	1,569,161	-2.54%	384,921	1.96%	24.53%
1982	1,542,592	-1.69%	386,357	0.37%	25.05%
1983	1,493,482	-3.18%	382,923	-0.89%	25.64%
1984	1,579,033	5.73%	394,951	3.14%	25.01%
1985	1,624,756	2.90%	412,115	4.35%	25.36%
1986	1,658,941	2.10%	425,181	3.17%	25.63%

SOURCE: U.S Bureau of the Census, Wisconsin County Business Patterns, 1975-1986.

* See p. 80 for an explanation of the industries represented by the two-digit SIC codes.

Table 15 presents the times series on employment for each industry as well as for the total number of persons employed in these industries. Table 16 lists annual rates of change in employment for each industry. As indicated in Table 15, employment in the selected industries generally shows a steady upward trend, with the exception of SIC 53, General Merchandise Stores. Employment in this industry decreased slightly over the period, with most of the decrease concentrated in the years 1982-1986.

Table 15

Employment by Year: Selected Two-Digit SIC Industries*
Wisconsin: 1975-1986

YEAR	47	51	53	58	59	60
1975	1,179	34,856	44,916	81,679	33,571	21,988
1976	1,148	36,521	45,294	89,306	34,855	22,260
1977	1,605	37,105	43,336	95,777	36,079	22,590
1978	1,889	36,785	44,165	106,717	39,060	24,567
1979	2,240	39,063	45,275	112,109	41,838	25,326
1980	2,435	39,165	44,439	112,130	41,117	26,491
1981	2,393	38,628	44,606	114,300	41,256	26,873
1982	2,595	39,455	41,825	118,425	40,556	26,468
1983	2,463	39,506	39,508	116,439	41,104	26,690
1984	3,201	40,261	38,709	120,845	41,257	27,013
1985	3,204	41,357	41,164	124,227	42,678	27,608
1986	3,670	42,585	40,224	126,669	43,891	26,620

YEAR	61	63	65	70	73	TOTAL
1975	8,169	22,876	10,649	16,146	30,752	306,781
1976	8,798	24,475	11,595	15,436	32,007	321,695
1977	9,389	26,997	11,624	16,468	33,568	334,538
1978	9,494	29,572	12,847	17,535	40,063	362,694
1979	10,266	28,043	13,131	17,245	42,494	377,030
1980	10,768	29,250	12,775	16,611	42,352	377,533
1981	11,446	31,258	12,735	17,866	43,560	384,921
1982	11,489	30,350	12,868	17,874	44,452	386,357
1983	12,181	31,855	11,796	17,213	44,168	382,923
1984	13,055	31,137	12,489	17,193	49,791	394,951
1985	13,249	32,009	12,888	17,979	55,752	412,115
1986	14,368	32,461	12,733	18,550	63,410	425,181

SOURCE: Wisconsin County Business Patterns, 1975-1986.

* See p. 80 for an explanation of the industries represented by the two-digit SIC codes.

SIC 58, Eating and Drinking Places, is especially noteworthy among these selected industries as it accounts for more than a quarter of total employment, and employment in the industry is growing relatively rapidly, averaging 4.14 percent for the period. The smallest industry in terms of employment, Transportation Services, SIC 47, is also the most rapidly growing, averaging 11.67 percent growth for the period. Growth in this industry has been uneven, with several years showing employment losses. Employment in Transportation Services appears to be weakly related to the business cycle.

Table 16

Annual Percent Change: Selected Two-Digit SIC Industries* Wisconsin: 1975-1986

YEAR	47	51	53	58	59	60
1975	---	---	---	---	---	---
1976	-2.63%	4.78%	0.84%	9.34%	3.82%	1.24%
1977	39.81%	1.60%	-4.32%	7.25%	3.51%	1.48%
1978	17.69%	-0.86%	1.91%	11.42%	8.26%	8.75%
1979	18.58%	6.19%	2.51%	5.05%	7.11%	3.09%
1980	8.71%	0.26%	-1.85%	0.02%	-1.72%	4.60%
1981	-1.72%	-1.37%	0.38%	1.94%	0.34%	1.44%
1982	8.44%	2.14%	-6.23%	3.61%	-1.70%	-1.51%
1983	-5.09%	0.13%	-5.54%	-1.68%	1.35%	0.84%
1984	29.96%	1.91%	-2.02%	3.78%	0.37%	1.21%
1985	0.09%	2.72%	6.34%	2.80%	3.44%	2.20%
1986	14.54%	2.97%	-2.28%	1.97%	2.84%	-3.58%
AVERAGE	11.67%	1.86%	-0.93%	4.14%	2.51%	1.80%

YEAR	61	63	65	70	73	TOTAL
1975	---	---	---	---	---	---
1976	7.70%	6.99%	8.88%	-4.40%	4.08%	4.86%
1977	6.72%	10.30%	0.25%	6.69%	4.88%	3.99%
1978	1.12%	9.54%	10.52%	6.48%	19.35%	8.42%
1979	8.13%	-5.17%	2.21%	-1.65%	6.07%	3.95%
1980	4.89%	4.30%	-2.71%	-3.68%	-0.33%	0.13%
1981	6.30%	6.86%	-0.31%	7.56%	2.85%	1.96%
1982	0.38%	-2.90%	1.04%	0.04%	2.05%	0.37%
1983	6.02%	4.96%	-8.33%	-3.70%	-0.64%	-0.89%
1984	7.18%	-2.25%	5.87%	-0.12%	12.73%	3.14%
1985	1.49%	2.80%	3.19%	4.57%	11.97%	4.35%
1986	8.45%	1.41%	-1.20%	3.18%	13.74%	3.17%
AVERAGE	5.02%	3.49%	2.65%	1.72%	7.07%	3.39%

SOURCE: Wisconsin County Business Patterns, 1975-1986.

* See p. 80 for an explanation of the industries represented by the two-digit SIC codes.

The most interesting industry among the selected two digit industries is SIC 73, Business Services. In 1975 Business Services was the fifth largest employer among these eleven industries. By 1986 it was the second largest employer. Business Services jobs accounted for 10 percent of the total employment among these 11 industries in 1975, but it provided 25 percent of the employment growth over this 12 year period. Annual growth in the industry has been steady and strong, with only two years showing small employment decreases. All industry employment grew especially rapidly in the last three years shown in the data. The section which follows examines Business Services at the more disaggregated level afforded by the three-digit SIC industry definitions.

4 WISCONSIN BUSINESS SERVICES INDUSTRIES

Table 17 presents the three-digit SIC business services industries which were chosen for analysis. Employment in these six three-digit SIC industries totaled 52,374 in 1986, up from 25,044 in 1975. This represents just over 80 percent of total employment in the Business Services industries.

Table 17

Selected Business Services Industries

SIC	INDUSTRY
731	Advertising
732	Credit Reporting and Collection Agencies
733	Mailing, Reproduction, Commercial Art and Photography, and Stenographic Services
736	Personnel Supply Services
737	Computer and Data Processing Services
739	Miscellaneous Business Services (Research and Development Laboratories; Management, Consulting and Public Relations Services; Detective Agencies and Protective Services; Equipment Rental and Leasing Services, Photofinishing Laboratories, Trading Stamp Services; Commercial Testing Laboratories)

Annual payroll (measured in current dollars) in the selected Business Services industries increased steadily over the 12 year period of data presented, as shown in Table 18. As a percent of the total Wisconsin annual payroll, the selected industries nearly doubled in size. The industries' share of total payroll increased throughout the period, suggesting that this growth is part of a long term trend. The average annual increase in payroll for these industries was 15.03 percent; this is nearly double the 8.05 percent average annual payroll increase for the economy as a whole.

Table 18

Annual Payroll: Total Private Economy and Selected Three-Digit SIC Business Services Industries* Wisconsin: 1975-1986

YEAR	TOTAL ECONOMY	SELECTED BUSINESS SERVICES THREE DIGIT SICs	SELECTED BUSINESS SERVICES PAYROLL AS A PERCENT OF TOTAL ECONOMY PAYROLL
1975	$12,820,248	$166,104	1.30%
1976	$14,291,084	$197,706	1.38%
1977	$15,901,682	$225,545	1.42%
1978	$18,241,679	$265,772	1.46%
1979	$20,419,271	$320,744	1.57%
1980	$21,502,850	$367,104	1.71%
1981	$23,112,266	$414,903	1.80%
1982	$23,428,873	$461,872	1.97%
1983	$24,440,023	$478,122	1.96%
1984	$26,869,165	$587,615	2.19%
1985	$28,436,728	$678,331	2.39%
1986	$29,835,622	$766,688	2.57%

SOURCE: U.S. Bureau of the Census, Wisconsin County Business Patterns, 1975-1986.

* See p. 88 for an explanation of the industries represented by the three-digit SIC codes.

As indicated in Table 19, the selected three-digit industries registered steady gains in employment from 1975-1986, with the exception of 1983. The average annual increase in Business Services employment for the period was 7.09 percent, substantially above the total economy's 1.99 percent average growth rate. Employment in these Business Services industries more than doubled in this period.

Table 19

Wage and Salary Employment: Total Private Economy and Selected Three-Digit SIC Business Services Industries* Wisconsin: 1975-1986

YEAR	TOTAL PRIVATE EMPLOY-MENT	TOTAL PRIVATE ANNUAL % CHANGE	SELECTED BUSINESS SERVICES EMPLOY-MENT	SELECTED BUSINESS SERVICES ANNUAL % CHANGE	SELECTED BUSINESS SERVICES EMPLOYMENT AS A PERCENT OF TOTAL PRIVATE EMPLOYMENT
1975	1,345,446	---	25,044	---	1.86%
1976	1,381,848	2.71%	26,309	5.05%	1.90%
1977	1,430,748	3.54%	27,263	3.62%	1.91%
1978	1,557,232	8.84%	32,261	18.33%	2.07%
1979	1,628,154	4.55%	33,882	5.03%	2.08%
1980	1,610,115	-1.11%	34,907	3.02%	2.17%
1981	1,569,161	-2.54%	35,722	2.34%	2.28%
1982	1,542,592	-1.69%	36,909	3.32%	2.39%
1983	1,493,482	-3.18%	36,484	-1.15%	2.44%
1984	1,579,033	5.73%	41,027	12.45%	2.60%
1985	1,624,756	2.90%	45,975	12.06%	2.83%
1986	1,658,941	2.10%	52,374	13.92%	3.16%

SOURCE: U.S. Bureau of the Census, Wisconsin County Business Patterns, 1975-1986.

* See p. 88 for an explanation of the industries represented by the three-digit SIC codes.

Table 20 presents employment data for 1975-1986 by three-digit business services industries. Most employees (about three-fourths) in this group of industries work in either SIC 736, Personnel Supply Services, or SIC 739, Miscellaneous Business Services. The Miscellaneous Business Services jobs are spread over a wide spectrum of businesses. Most of the Personnel jobs are with Temporary Help Supply Services, a very rapidly growing business service. One result of businesses' efforts to increase their ability to respond flexibly to new problems and opportunities has been an increase in the proportion of their workforce which is hired on a part-time or temporary basis. However, this trend has shown some signs of slowing down (Personick 1987). One reason for the slowdown is decreases in the numbers of youth (ages 18-24) in the labor force. Young workers have traditionally comprised the bulk of the temporary/part-time labor force.

Table 20

Employment by Year: Selected Three-Digit SIC Business Services Industries*
Wisconsin: 1975-1986

YEAR	731	732	733	736	737	739	TOTAL
1975	1,754	843	1,276	7,040	2,006	12,125	25,044
1976	1,801	867	1,406	6,941	2,442	12,852	26,309
1977	1,687	892	1,452	7,481	2,501	13,250	27,263
1978	1,773	916	1,661	9,889	3,088	14,934	32,261
1979	2,119	940	2,013	10,421	3,212	15,177	33,882
1980	2,245	965	2,009	9,131	3,818	16,739	34,907
1981	2,338	977	2,026	9,420	4,191	16,770	35,722
1982	1,910	1,120	2,297	8,474	5,864	17,244	36,909
1983	1,879	950	2,826	9,525	4,684	16,620	36,484
1984	2,129	1,048	2,896	12,268	5,018	17,668	41,027
1985	2,612	1,015	2,958	15,065	5,329	18,996	45,975
1986	2,590	1,191	3,503	18,302	5,583	21,205	52,374

SOURCE: Wisconsin County Business Patterns, 1975-1986.

* See p. 88 for an explanation of the industries represented by the three-digit SIC codes.

Three industries in the selected three digit business services industries are growing especially rapidly: SIC 733, Mailing, Reproduction and Stenographic Services; SIC 736, Personnel Supply

Services; and SIC 737, Computer and Data Processing Services. Most of the employment growth in SIC 733 is explained by the rapid expansion of Direct Mail Advertising Services, although all sectors of this industry, with the exception of Stenographic Services, show strong employment gains. Most of the growth from 1975-1986, and more than 85 percent of the employment in SIC 736 is accounted for by the rapid expansion of Temporary Help Supply Services. The employment growth in SIC 737 is primarily due to growth in Computer Programming and other Software Services. Employment in Data Processing Services continues to expand but not as rapidly as in years past. Table 21 shows that the strongest period of growth for SIC 737 occurred before 1983. The last three years in the time series show much more moderate gains in employment.

Table 21

Annual Percent Change: Selected Three-Digit SIC Business Services Industries*
Wisconsin: 1975-1986

YEAR	731	732	733	736	737	739	TOTAL
1975	---	---	---	---	---	---	---
1976	2.68%	2.89%	10.19%	-1.41%	21.73%	6.00%	5.05%
1977	-6.33%	2.81%	3.27%	7.78%	2.42%	3.10%	3.62%
1978	5.10%	2.73%	14.39%	32.19%	23.47%	12.71%	18.33%
1979	19.51%	2.66%	21.19%	5.38%	4.02%	1.63%	5.03%
1980	5.95%	2.59%	-0.20%	-12.38%	18.87%	10.29%	3.02%
1981	4.14%	1.26%	0.85%	3.17%	9.77%	0.19%	2.34%
1982	-18.31%	14.64%	13.38%	-10.04%	39.92%	2.83%	3.32%
1983	-1.62%	-15.18%	23.03%	12.40%	-20.12%	-3.62%	-1.15%
1984	13.30%	10.32%	2.48%	28.80%	7.13%	6.31%	12.45%
1985	22.69%	-3.15%	2.14%	22.80%	6.20%	7.52%	12.06%
1986	-0.84%	17.34%	18.42%	21.49%	4.77%	11.63%	13.92%
AVERAGE	4.21%	3.54%	9.92%	10.02%	10.74%	5.32%	7.09%

SOURCE: Wisconsin County Business Patterns, 1975-1986.
* See p. 88 for an explanation of the industries represented by the three-digit SIC codes.

Table 22 contains data on the number of establishments for each of the selected three-digit SIC Business Services industries is presented. Although the number of establishments is increasing in all industries, the number of establishments is increasing less rapidly over time than is the number of employees in these industries. This indicates that the average firm size is increasing. The lone exception to this trend is SIC 737, Computer and Data Processing Services. Here, average firm size substantially decreased. This is consistent with the increasingly significant role that employment in software services is playing in this industry and the diminishing importance of data processing establishments. Software service businesses tend to be relatively small.

Table 22

Establishments by Year: Selected Three-Digit SIC Business Services Industries*
Wisconsin: 1975-1986

YEAR	731	732	733	736	737	739	TOTAL
1975	194	105	183	140	108	902	1,632
1976	196	113	190	144	124	1,018	1,785
1977	194	124	213	183	140	1,047	1,901
1978	196	124	220	193	158	1,068	1,959
1979	199	127	242	206	183	1,044	2,001
1980	208	126	252	214	210	1,109	2,119
1981	202	126	265	216	235	1,210	2,254
1982	226	131	290	229	276	1,340	2,492
1983	232	124	355	269	312	1,536	2,828
1984	258	125	379	263	[illegible]20	1,605	2,950
1985	284	118	367	274	335	1,625	3,003
1986	284	116	370	307	343	1,697	3,117

SOURCE: Wisconsin County Business Patterns, 1975-1986.
* See p. 88 for an explanation of the industries represented by the three-digit SIC codes.

5 EMPLOYMENT IN BUSINESS AND MARKETING INDUSTRIES BY OCCUPATION

Table 23 presents employment in selected two digit SIC industries by detailed occupational group.[1] The top ten business and marketing occupations in terms of employment are reported for each industry. The percent of total business and marketing employment in each industry is also reported for each occupational category. Percents will not add to 100 since not all business and marketing occupations in each industry are listed.

The data in this table can be used to provide a detailed picture of the distribution of occupations in industries that typically employ a significant number of business and marketing graduates. For example, in Transportation Services, the most common business and marketing job is as a Sales Agent. More than two thirds of the business and marketing related employment in this industry is accounted for by this occupational category. In other industries, employment is more evenly distributed across several occupational categories. In Wholesale Trade-nondurable goods, for example, most business and marketing jobs are in Commodity Sales. Nearly 20 percent of the business and marketing employment in this industry is in General Office Occupations, and more than 10 percent of the jobs are in Materials Recording, Scheduling, and

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[1] Industries and occupations reported in this table were selected with the help of the VTAE business and marketing program consultants.

Distribution. The remaining 25 percent of employment is scattered of a large number of occupational categories.

Table 23

Employment in Selected Two-Digit SIC Business and Marketing Industries* by Occupation Wisconsin: 1986 and 2000

	ACTUAL	PROJECTED		PERCENT
	PERCENT			
OCCUPATION TITLE	1986 EMP	2000 EMP	INDUSTRY EMP 1986	INDUSTRY EMP 2000
Transportation services: SIC 47				
SALES AGENTS, BUSINESS SERVICES	7272	7924	66.09	67.87%
GENERAL OFFICE OCCUPATIONS	1748	1692	15.89	14.49
FIRST LINE SUPERVISORS, CLERICAL	472	498	4.29	4.27
SECRETARIES	340	356	3.09	3.05
COMMUNICATION,TRANSP.,UTIL.MGRS	280	296	2.54	2.54
DISPATCHERS: EXC. POL.,FIRE,AMB.	280	284	2.54	2.43
PERSONAL SERVICE OCCUPATIONS	224	236	2.04	2.02
DATA PROCESSING, OFFICE MACHINES	104	96	0.95	0.82
ACCOUNTANTS AND AUDITORS	76	94	0.69	0.81
MAIL & MESSAGE DISTRIB.WORKER	72	64	0.65	0.55
Wholesale trade--nondurable goods: SIC 51				
COMMODITY SALES	38884	47692	43.25	44.97
GENERAL OFFICE OCCUPATIONS	18848	21092	20.96	19.89
MATERIAL RECORD, SCHED.,DISTRIB	10580	11420	11.77	10.77
SECRETARIES	5448	6568	6.06	6.19
DINING ROOM & BARTENDER HELPERS	3756	4608	4.18	4.35
PURCHASING AGENTS & BUYERS, FARM	2724	3160	3.03	2.98
DATA PROCESSING, OFFICE MACHINES	2012	2156	2.24	2.03
FIRST LINE SUPERVISORS, SALES	1742	2106	1.94	1.99
FINANCIAL MANAGERS	1466	1720	1.63	1.62
FIRST LINE SUPERVISORS, CLERICAL	1416	1740	1.58	1.64

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* See p. xx for an explanation of the industries represented by the three-digit SIC codes.

Table 21 continued

OCCUPATION TITLE	ACTUAL 1986 INDUSTRY EMP	PROJECTED 2000 INDUSTRY EMP	PERCENT INDUSTRY EMP 1986	PERCENT INDUSTRY EMP 2000
General merchandising stores: SIC 53				
COMMODITY SALES	114432	142224	71.52	74.10
OFFICE OCCUPATIONS	10864	11064	6.79	5.76
DISPATCHERS: EXC. POL.,FIRE,AMB.	9692	10620	6.06	5.53
CREDIT CHECKERS	4096	4448	2.56	2.32
PERSONAL SERVICE OCCUPATIONS	3024	3540	1.89	1.84
BREAD AND PASTRY	2992	3508	1.87	1.83
FIRST LINE SUPERVISORS, SALES	2514	2966	1.57	1.55
PURCHASING AGENTS & BUYERS, FARM	2348	2324	1.47	1.21
FIRST LINE SUPERVISORS, CLERICAL	2022	2252	1.26	1.17
FINANCIAL MANAGERS	1508	1704	0.94	0.89
Eating and drinking places: SIC 58				
COOKS, INSTITUTION OR CAFETERIA	233364	279442	94.19	94.23
COMMODITY SALES	6658	8108	2.69	2.73
FOOD SERVICE & LODGING MANAGERS	3635	4582	1.47	1.55
GENERAL OFFICE OCCUPATIONS	2576	2586	1.04	0.87
ACCOUNTANTS AND AUDITORS	493	651	0.20	0.22
SECRETARIES	510	596	0.21	0.20
ALL OTHER MANAGERS & ADMINIST.	322	376	0.13	0.13
FIRST LINE SUPERVISORS, CLERICAL	122	140	0.05	0.05
FINANCIAL MANAGERS	42	48	0.02	0.02
FIRST LINE SUPERV.:MECH.& REPAIR	22	26	0.01	0.01
Miscellaneous retail: SIC 59				
COMMODITY SALES	88012	109856	68.79	71.69
GENERAL OFFICE OCCUPATIONS	14348	14876	11.21	9.71
RECORD., SCHED.,DISTRIB	7008	7272	5.48	4.75
FOOD AND BEVERAGE OCCUPATIONS	4836	5816	3.78	3.80
SECRETARIES	3108	3680	2.43	2.40
FIRST LINE SUPERVISORS, SALES	2420	2856	1.89	1.86
WHOLESALE, RETAIL BUYERS,EX.FARM	2072	2092	1.62	1.37
STORES FINANCIAL MANAGERS	1772	1980	1.38	1.29
BILL., POST, CALCULATING MACH.OP	1464	1236	1.14	0.81
ALL OTHER FINANCIAL SPECIALISTS	468	618	0.37	0.40

Table 21 continued

OCCUPATION TITLE	ACTUAL PERCENT 1986 INDUSTRY EMP	PROJECTED 2000 EMP	PERCENT INDUSTRY EMP 1986	EMP 2000
Banking: SIC 60				
BANKING,SECURITY,FINANCE,CREDIT	45776	53456	50.83	49.53
OFFICE OCCUPATIONS	18076	21740	20.07	20.14
MACHINE OPERATORS	5020	5788	5.57	5.36
ACCOUNTANTS AND AUDITORS	3892	5214	4.32	4.83
SECRETARIES	4120	5100	4.57	4.73
FINANCIAL MANAGERS	30[illegible]	3788	3.34	3.51
COMPUTER PROGRAMMER AIDES	1860	2516	2.07	2.33
FIRST LINE SUPERVISORS, CLERICAL	1920	2490	2.13	2.31
ALL OTHER MANAGERS & ADMINIST.	1896	2348	2.11	2.18
MAIL CLERKS, EXC. MAIL MACHINE	1208	1356	1.34	1.26
COMMODITY SALES	768	1044	0.85	0.97
SWITCHBOARD OPERATORS	780	900	0.87	0.83
Credit agencies other than banks: SIC 61				
CREDIT CHECKERS	23980	27612	48.93	46.93
GENERAL OFFICE OCCUPATIONS	8196	10108	16.73	17.18
LOAN OFFICERS AND COUNSELORS	3774	4902	7.70	8.33
SECRETARIES	3016	3700	6.15	6.29
FINANCIAL MANAGERS	2666	3290	5.44	5.59
INSURANCE SALES WORKERS	2048	2716	4.18	4.62
FIRST LINE SUPERVISORS, CLERICAL	942	1196	1.92	2.03
BILL., POST, CALCULATING MACH.OP	1040	1100	2.12	1.87
ALL OTHER MANAGERS & ADMINIST.	702	860	1.43	1.46
COMPUTER AND RELATED OCCUPATIONS	576	828	1.18	1.41
Insurance: SIC 63				
GENERAL OFFICE OCCUPATIONS	30900	36228	33.32	32.48
SALES WORKERS	10660	13356	11.50	11.97
INSURANCE ADJUSTERS,INVESTIGATOR	11648	13214	12.56	11.85
COMPUTER PROGRAMMER AIDES	6360	8752	6.86	7.85
INSURANCE UNDERWRITERS	5124	6836	5.53	6.13
SECRETARIES	5624	6836	6.07	6.13
BILL., POST, CALCULATING MACH.OP	6260	6700	6.75	6.01
FIRST LINE SUPERVISORS, CLERICAL	2602	3284	2.81	2.94
FINANCIAL MANAGERS	1962	2480	2.12	2.22
ALL OTHER MANAGERS & ADMINIST.	2026	2472	2.18	2.22

Table 21 continued

	ACTUAL PERCENT	PROJECTED	PERCENT INDUSTRY	
OCCUPATION TITLE	1986 INDUSTRY EMP	2000 EMP	EMP 1986	EMP 2000
Real Estate: SIC 65				
GENERAL OFFICE OCCUPATIONS	7848	9140	33.09	32.01
ALL OTHER SERVICE SALES OCC.	5748	7184	24.23	25.16
SECRETARIES	3460	4184	14.59	14.65
TITLE SEARCHERS	1784	2168	7.52	7.59
FINANCIAL MANAGERS	1268	1476	5.35	5.17
FIRST LINE SUPERVISORS, SALES	852	1028	3.59	3.60
REAL ESTATE CLERKS	604	758	2.55	2.65
ALL OTHER FOOD SERVICE WORKERS	492	592	2.07	2.07
MANAGERS PROPERTY, REAL ESTATE MANAGEMENT	456	588	1.92	2.06
ACCOUNTANTS AND AUDITORS	286	394	1.21	1.38
Hotels, rooming houses, camps and other lodging places: SIC 70				
BARTENDERS	34080	46772	76.47	77.95
TRAVEL CLERKS	2488	3226	5.58	5.38
COMMODITY SALES	1744	2260	3.91	3.77
GENERAL OFFICE OCCUPATIONS	1340	1436	3.01	2.39
SECRETARIES	980	1260	2.20	2.10
FOOD SERVICE & LODGING MANAGERS	730	1042	1.64	1.74
CHILD CARE WORKERS	636	792	1.43	1.32
ALL OTHER MANAGERS & ADMINIST.	464	594	1.04	0.99
FINANCIAL MANAGERS	424	524	0.95	0.87
FIRST LINE SUPERVISORS, SALES	340	440	0.76	0.73

Table 21 continued

OCCUPATION TITLE	ACTUAL 1986 INDUSTRY EMP	PROJECTED 2000 EMP	PERCENT INDUSTRY EMP 1986	PERCENT INDUSTRY EMP 2000
Business services: SIC 73				
GENERAL OFFICE OCCUPATIONS	32988	41172	27.70	26.70
COMPUTER PROGRAMMERS	11652	17680	9.78	11.47
PERSONNEL SPECIALISTS & RELATED OCC	9920	14584	8.33	9.46
MATERIAL RECORD., SCHED.,DISTRIB	11632	14200	9.77	9.21
SECRETARIES	9756	12916	8.19	8.38
MAIL MACHINE OPERATORS	11400	11604	9.57	7.53
ALL OTHER SERVICE SALES	8700	11528	7.30	7.48
TOTAL SALES REPS.EXC.SCIENTIF & RETAIL	7220	9656	6.06	6.26
FINANCIAL MANAGERS	5198	6976	4.36	4.52
COMMUNICATIONS EQUIP. OPERATORS	1744	2048	1.46	1.33

SOURCE: Bureau of Labor Market Information, Department of Industry, Labor, and Human Relations, (1989).

6 EMPLOYMENT IN BUSINESS AND MARKETING OCCUPATIONS BY INDUSTRY

Table 24 presents employment in broadly defined business and marketing occupations by three digit SIC industry.[1] The top 15 industries in terms of projected 2000 employment are listed for those industries where employment exceeded 200 persons. In some occupations employment is so diverse that only one or two industries employed more than 200 persons. The line labeled "TOTAL ALL INDUSTRIES" reports the total employment in the industries listed for each occupation. That is, it reports the total employment for each occupation in industries that employ more than 200 persons.

The data in Table 24 allow examination of the distribution of employment by industry for selected business and marketing occupational categories. Most occupations show a wide range of industries providing employment. In many occupations no industry employs more than 10 percent of the workforce.

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[1] Industries and occupations reported in this table were selected with the help of the VTAE business and marketing program consultants.

Table 24

Employment in Selected Business and Marketing Occupations[†] by Industry Wisconsin: 1986-2000

SIC	INDUSTRY TITLE	1986 EMP	2000 EMP	PERCENT OCCUPATION EMP 1986	PERCENT OCCUPATION EMP 2000
MANAGEMENT AND ADMINISTRATIVE OCCUPATIONS*: OES 130					
	TOTAL ALL INDUSTRIES	12480	15025	100.00	100.00
883	SELF-EMPLOYED	2873	3306	23.0	22.0
602	COMMERCIAL AND STOCK SAVINGS BANKS	1482	1869	11.9	12.4
739	MISCELLANEOUS BUSINESS SERVICES	1199	1587	9.6	10.6
806	HOSPITALS	730	962	5.9	6.4
541	GROCERY STORES	898	946	7.2	6.3
531	DEPARTMENT STORES	687	782	5.5	5.2
614	PERSONAL CREDIT INSTITUTIONS	617	756	4.9	5.0
731	ADVERTISING	543	737	4.4	4.9
362	ELECTRICAL INDUSTRIAL APPARATUS	588	687	4.7	4.6
551	MOTOR VEHICLE DEALERS (NEW & USED)	523	651	4.2	4.3
262	PAPER MILLS, EXCEPT BUILDING PAPER	597	631	4.8	4.2
352	FARM AND GARDEN MACHINERY	566	622	4.5	4.1
633	FIRE, MARINE, AND CASUALTY INSURANCE	468	591	3.8	3.9
612	SAVINGS AND LOAN ASSOCIATIONS	451	572	3.6	3.8
596	NONSTORE RETAILERS	258	326	2.1	2.2

[†] The occupational data are from the Wisconsin Department of Industry, Labor and Human Relations. OES refers to the first three digits of the occupational code used by DILHR for each occupation.

[*] Includes Financial Managers; Personnel Training, Labor Relations Managers; Purchasing Managers; Marketing, Advertising and Public Relations Managers; and Administrative Services Managers.

Table 22 continued

SIC	INDUSTRY TITLE	1986 OCCUPATION EMP	2000 OCCUPATION EMP	PERCENT OCCUPATION EMP 1986	PERCENT EMP 2000
MANAGEMENT AND ADMINISTRATIVE OCCUPATIONS*: OES 150					
	TOTAL ALL INDUSTRIES	15430	16847	100.00	100.00
883	SELF-EMPLOYED	9952	10432	64.5	61.9
806	HOSPITALS	1519	1938	9.8	11.5
421	TRUCKING, LOCAL AND LONG DISTANCE	848	909	5.5	5.4
154	NONRESIDENTIAL BUILDING CONSTRUCTION	589	617	3.8	3.7
152	RESIDENTIAL BUILDING CONSTRUCTION	493	521	3.2	3.1
805	NURSING AND PERSONAL CARE FACILITIES	397	520	2.6	3.1
701	HOTELS, MOTELS, AND TOURIST COURTS	332	474	2.2	2.8
799	MISC. AMUSEMENT AND RECREATION SERVICES	304	406	2.0	2.4
481	TELEPHONE COMMUNICATION	344	368	2.2	2.2
202	DAIRY PRODUCTS	363	361	2.4	2.1
171	PLUMBING, HEATING, AIR CONDITIONING	289	301	1.9	1.8
ALL OTHER MANAGERS AND ADMINISTRATORS: OES 199					
	TOTAL ALL INDUSTRIES	13987	16760	100.00	100.00
883	SELF-EMPLOYED	6830	8172	48.8	48.8
863	LABOR UNIONS	2352	3106	16.8	18.5
602	COMMERCIAL AND STOCK SAVINGS BANKS	936	1159	6.7	6.9
806	HOSPITALS	727	933	5.2	5.6
633	FIRE, MARINE, AND CASUALTY INSURANCE	623	763	4.5	4.6
531	DEPARTMENT STORES	463	546	3.3	3.3
351	ENGINES AND TURBINES	364	396	2.6	2.4
370	TRANSP. EQUIP, TOTAL	391	352	2.8	2.1
369	MISC. ELECTRICAL EQUIPMENT AND SUPPLIES	342	347	2.5	2.1
262	PAPER MILLS, EXCEPT BUILDING PAPER	333	341	2.4	2.0
371	MOTOR VEHICLES AND EQUIPMENT	374	338	2.7	2.0
632	MEDICAL SERVICE AND HEALTH INSURANCE	252	307	1.8	1.8

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* Includes Property and Real Estate Management; Construction Managers; Food Service and Lodging Managers; Medicine and Health Service Managers.

Table 22 continued

SIC	INDUSTRY TITLE	1986 OCCUPATION EMP	2000 OCCUPATION EMP	PERCENT OCCUPATION EMP 1986	PERCENT EMP 2000
FINANCIAL SPECIALISTS: OES 211					
	TOTAL ALL INDUSTRIES	12238	16033	100.00	100.00
893	ACCOUNTING, AUDITING & BOOKKEEPING	3395	4696	27.7	29.3
602	COMMERCIAL AND STOCK SAVINGS BANKS	1938	2594	15.8	16.2
633	FIRE, MARINE, AND CASUALTY INSURANCE	1515	2024	12.4	12.6
883	SELF-EMPLOYED	1645	1778	13.4	11.1
612	SAVINGS AND LOAN ASSOCIATIONS	788	1044	6.4	6.5
614	PERSONAL CREDIT INSTITUTIONS	543	716	4.4	4.5
632	MEDICAL SERVICE AND HEALTH INSURANCE	501	668	4.1	4.2
631	LIFE INSURANCE	398	532	3.3	3.3
671	HOLDING OFFICES	353	482	2.9	3.0
508	MACHINERY, EQUIPMENT, AND SUPPLIES	284	396	2.3	2.5
739	MISCELLANEOUS BUSINESS SERVICES	274	389	2.2	2.4
481	TELEPHONE COMMUNICATION	321	363	2.6	2.3
616	MORTGAGE BANKERS AND BROKERS	283	351	2.3	2.2
PURCHASING AGENTS AND BUYERS: OES 213					
	TOTAL ALL INDUSTRIES	7778	8084	100.00	100.00
541	GROCERY STORES	2928	2898	37.6	35.9
883	SELF-EMPLOYED	1342	1428	17.3	17.7
531	DEPARTMENT STORES	862	856	11.1	10.6
508	MACHINERY, EQUIPMENT, AND SUPPLIES	776	842	10.0	10.4
514	GROCERIES AND RELATED PRODUCTS	650	756	8.4	9.4
594	MISCELLANEOUS SHOPPING GOODS STORES	530	520	6.8	6.4
519	MISCELLANEOUS NONDURABLE GOODS	346	404	4.5	5.0
506	ELECTRICAL GOODS	344	380	4.4	4.7
PERSONNEL SPECIALISTS AND RELATED OCCUPATIONS: OES 215					
	TOTAL ALL INDUSTRIES	6996	9928	100.00	100.00
736	PERSONNEL SUPPLY SERVICES	4852	7130	69.4	71.8
863	LABOR UNIONS & SIMILAR LABOR ORGANIZATIONS	1082	1452	15.5	14.6
633	FIRE, MARINE, AND CASUALTY INSURANCE	534	674	7.6	6.8
883	SELF-EMPLOYED	304	370	4.4	3.7
839	SOCIAL SERVICES, N.E.C.	224	302	3.2	3.0

Table 22 continued

SIC	INDUSTRY TITLE	1986 OCCUPATION EMP	2000 OCCUPATION EMP	PERCENT OCCUPATION EMP 1986	PERCENT EMP 2000
	COMPUTER AND RELATED OCCUPATIONS: OES 251				
	TOTAL ALL INDUSTRIES	15278	21810	100.00	100.00
737	COMPUTER AND DATA PROCESSING SERVICES	4814	7424	31.5	34.0
633	FIRE, MARINE, AND CASUALTY INSURANCE	1460	2000	9.6	9.2
508	MACHINERY, EQUIPMENT, AND SUPPLIES	1130	1684	7.4	7.7
631	LIFE INSURANCE	1158	1594	7.6	7.3
883	SELF-EMPLOYED	1114	1472	7.3	6.8
739	MISCELLANEOUS BUSINESS SERVICES	990	1388	6.5	6.4
602	COMMERCIAL AND STOCK SAVINGS BANKS	926	1254	6.1	5.8
481	TELEPHONE COMMUNICATION	636	1022	4.2	4.7
352	FARM AND GARDEN MACHINERY	548	714	3.6	3.3
493	COMBINATION COMPANIES AND SYSTEMS	516	644	3.4	3.0
354	METALWORKING MACHINERY	584	642	3.8	2.9
806	HOSPITALS	396	592	2.6	2.7
362	ELECTRICAL INDUSTRIAL APPARATUS	408	556	2.7	2.6
632	MEDICAL SERVICE AND HEALTH INSURANCE	306420	0.57	2.0	1.9
491	ELECTRIC COMPANIES AND SERVICES	292	404	1.9	1.9
	PARALEGALS (LEGAL ASSISTANTS) AND TITLE SEARCHERS: OES 283				
	TOTAL ALL INDUSTRIES,	1512	1960	100.00	100.00
654	TITLE ABSTRACT OFFICES	858	1042	56.8	53.2
739	MISCELLANEOUS BUSINESS SERVICES	356	470	23.5	24.0
636	TITLE INSURANCE	298	348	19.7	17.8
	FIRST LINE SUPERVISORS, SALES: OES 410				
	TOTAL ALL INDUSTRIES	6992	8395	100.00	100.00
883	SELF-EMPLOYED	3868	4674	55.3	55.7
531	DEPARTMENT STORES	1043	1230	14.9	14.7
594	MISCELLANEOUS SHOPPING GOODS STORES	447	527	6.4	6.3
508	MACHINERY, EQUIPMENT, AND SUPPLIES	402	491	5.8	5.9
591	DRUG STORES & PROPRIETARY STORES	334	395	4.8	4.7
566	SHOE STORES	331	388	4.7	4.7
275	COMMERCIAL PRINTING	293	367	4.2	4.4
562	WOMEN'S READY-TO-WEAR STORES	274	323	3.9	3.9

Table 22 continued

SIC	INDUSTRY TITLE	1986 OCCUPATION EMP	2000 OCCUPATION EMP	PERCENT OCCUPATION EMP 1986	PERCENT EMP 2000
SERVICE SALES OCCUPATIONS: OES 430					
	TOTAL ALL INDUSTRIES	33632	41458	100.00	100.00
883	SELF-EMPLOYED	11306	14084	33.6	34.0
621	SECURITY BROKERS AND DEALERS	3926	4976	11.7	12.0
631	LIFE INSURANCE	3178	3960	9.5	9.6
472	ARRANGEMENT OF TRANSPORTATION	3532	3850	10.5	9.3
653	REAL ESTATE AGENTS AND MANAGERS	2170	2726	6.5	6.6
731	ADVERTISING	1650	2180	4.9	5.3
633	FIRE, MARINE, AND CASUALTY INSURANCE	1546	1966	4.6	4.7
739	MISCELLANEOUS BUSINESS SERVICES	1488	1962	4.4	4.7
270	NEWSPAPERS	1156	1476	3.4	3.6
483	RADIO AND TELEVISION BROADCASTING	1136	1210	3.4	2.9
421	TRUCKING, LOCAL AND LONG DISTANCE	722	774	2.2	1.9
632	MEDICAL SERVICE AND HEALTH INSURANCE	524	652	1.6	1.6
650	REAL ESTATE OPERATORS AND LESSORS	514	640	1.5	1.5
616	MORTGAGE BANKERS AND BROKERS	408	532	1.2	1.3
275	COMMERCIAL PRINTING	376	470	1.1	1.1
RETAIL SALES: OES 490					
	TOTAL ALL INDUSTRIES	238266	294168	100.00	100.00
541	GROCERY STORES	52460	64012	22.0	21.8
531	DEPARTMENT STORES	47602	59390	20.0	20.2
883	SELF-EMPLOYED	34208	42072	14.4	14.3
594	MISCELLANEOUS SHOPPING GOODS STORES	16500	20624	6.9	7.0
508	MACHINERY, EQUIPMENT, AND SUPPLIES	14756	18148	6.2	6.2
591	DRUG STORES & PROPRIETARY STORES	11824	14326	5.0	4.9
551	MOTOR VEHICLE DEALERS (NEW & USED)	8822	11230	3.7	3.8
562	WOMEN'S READY-TO-WEAR STORES	8702	10762	3.7	3.7
554	GASOLINE SERVICE STATIONS	8320	9966	3.5	3.4
525	HARDWARE STORES	7716	9480	3.2	3.2
599	RETAIL STORES, N.E.C.	5744	7256	2.4	2.5
533	VARIETY STORES	5916	7194	2.5	2.5
521	LUMBER AND OTHER BLDG. MATERIALS DEALERS	5176	6850	2.2	2.3
566	SHOE STORES	5578	6824	2.3	2.3
514	GROCERIES AND RELATED PRODUCTS	4942	6034	2.1	2.1

Table 22 continued

SIC	INDUSTRY TITLE	1986 OCCUPATION EMP	2000 OCCUPATION EMP	PERCENT OCCUPATION EMP 1986	PERCENT EMP 2000
ALL OTHER SALES RELATED: OES 499					
	TOTAL ALL INDUSTRIES	4707	5701	100.00	100.00
883	SELF-EMPLOYED	2232	2716	47.4	47.6
541	GROCERY STORES	837	976	17.8	17.1
531	DEPARTMENT STORES	432	510	9.2	9.0
729	MISCELLANEOUS PERSONAL SERVICES	334	440	7.1	7.7
362	ELECTRICAL INDUSTRIAL APPARATUS	356	393	7.6	6.9
722	PHOTOGRAPHIC STUDIOS, PORTRAIT	264	351	5.6	6.2
275	COMMERCIAL PRINTING	252	315	5.4	5.5
FIRST LINE SUPERVISORS, CLERICAL: OES 510					
	TOTAL ALL INDUSTRIES	6071	7430	100.00	100.00
602	COMMERCIAL AND STOCK SAVINGS BANKS	949	1229	15.6	16.5
531	DEPARTMENT STORES	936	1043	15.4	14.0
631	LIFE INSURANCE	497	622	8.2	8.4
551	MOTOR VEHICLE DEALERS (NEW & USED)	527	600	8.7	8.1
633	FIRE, MARINE, AND CASUALTY INSURANCE	452	579	7.5	7.8
806	HOSPITALS	394	511	6.5	6.9
508	MACHINERY, EQUIPMENT, AND SUPPLIES	394	475	6.5	6.4
739	MISCELLANEOUS BUSINESS SERVICES	352	455	5.8	6.1
481	TELEPHONE COMMUNICATION	424	452	6.9	6.1
612	SAVINGS AND LOAN ASSOCIATIONS	346	443	5.7	6.0
632	MEDICAL SERVICE AND HEALTH INSURANCE	297	372	4.9	5.0
514	GROCERIES AND RELATED PRODUCTS	264	329	4.4	4.4
801	OFFICES OF PHYSICIANS	239	320	3.9	4.3
BANKING, SECURITY, FINANCE, CREDIT: OES 531					
	TOTAL ALL INDUSTRIES	38008	44026	100.00	100.00
602	COMMERCIAL AND STOCK SAVINGS BANKS	22800	26618	60.0	60.5
612	SAVINGS AND LOAN ASSOCIATIONS	6940	8004	18.3	18.2
614	PERSONAL CREDIT INSTITUTIONS	4156	4752	10.9	10.8
531	DEPARTMENT STORES	2048	2224	5.4	5.1
616	MORTGAGE BANKERS AND BROKERS	596	690	1.6	1.6
621	SECURITY BROKERS AND DEALERS	524	598	1.4	1.4
271	NEWSPAPERS BANKING,SECURITY,FINANCE,CREDIT	326	416	0.9	0.9
481	TELEPHONE COMMUNICATION	370	414	1.0	0.9
275	COMMERCIAL PRINTING	248	310	0.7	0.7

Table 22 continued

SIC	INDUSTRY TITLE	1986 OCCUPATION EMP	2000 OCCUPATION EMP	PERCENT OCCUPATION EMP 1986	PERCENT EMP 2000
INSURANCE: OES 533					
	TOTAL ALL INDUSTRIES	5620	6387	100.00	100.00
633	FIRE, MARINE, AND CASUALTY INSURANCE	2940	3267	52.3	51.2
632	MEDICAL SERVICE AND HEALTH INSURANCE	1872	2327	33.3	36.4
631	LIFE INSURANCE	808	793	14.4	12.4
BILL AND ACCOUNT COLLECTORS: OES 535					
	TOTAL ALL INDUSTRIES	450	644	100.00	100.00
732	CONSUMER CREDIT REPORTING AND COLLECTION	450	644	100.00	100.00
COURT, MUNICIPAL AND LICENSE CLERKS: OES 537					
	TOTAL ALL INDUSTRIES	1917	2216	100.00	100.00
930	LOCAL GOVT, EXC.EDUCATION & HOSPITALS	1917	2216	100.00	100.00
HOTEL DESK CLERKS; RESERVATION AND TRANS. AGENTS: OES 538					
	TOTAL ALL INDUSTRIES	1893	2304	100.00	100.00
701	HOTELS, MOTELS, AND TOURIST COURTS	1244	1613	65.7	70.0
451	CERTIFIED AIR TRANSPORATION	649	691	34.3	30.0
TEACHER AIDES AND EDUC. ASSISTANTS; LIBRARY ASSISTANTS: OES 539					
	TOTAL ALL INDUSTRIES	5561	6822	100.00	100.00
820	EDUCATIONAL SERVICES, TOTAL	3289	3811	59.1	55.9
835	CHILD DAY CARE SERVICES	808	1065	14.5	15.6
866	RELIGIOUS ORGANIZATIONS	577	752	10.4	11.0
839	SOCIAL SERVICES, N.E.C.	478	631	8.6	9.3
271	NEWSPAPERS	409	563	7.4	8.3

Table 22 continued

SIC	INDUSTRY TITLE	1986 OCCUPATION EMP	2000 EMP	PERCENT OCCUPATION EMP 1986	PERCENT EMP 2000	
SECRETARIES: OES 551						
	TOTAL ALL INDUSTRIES	31478	39884	100.00	100.00	
801	OFFICES OF PHYSICIANS	6068	7962	19.3	20.0	
866	RELIGIOUS ORGANIZATIONS	4620	6026	14.7	15.1	
806	HOSPITALS	3266	4192	10.4	10.5	
508	MACHINERY, EQUIPMENT, AND SUPPLIES	2478	3024	7.9	7.6	
602	COMMERCIAL AND STOCK SAVINGS BANKS	2020	2500	6.4	6.3	
739	MISCELLANEOUS BUSINESS SERVICES	1582	2086	5.0	5.2	
736	PERSONNEL SUPPLY SERVICES	1546	2024	4.9	5.1	
802	OFFICES OF DENTISTS	1400	1828	4.5	4.6	
804	OFFICES OF OTHER HEALTH PRACTITIONERS	1252	1670	4.0	4.2	
893	ACCOUNTING,AUDITING & BOOKKEEPING SERVICES		1210	1586	3.9	4.0
883	SELF-EMPLOYED MEDICAL	1308	1464	4.2	3.7	
631	LIFE INSURANCE	1170	1430	3.7	3.6	
421	TRUCKING, LOCAL AND LONG DISTANCE	1304	1398	4.1	3.5	
621	SECURITY BROKERS AND DEALERS	1176	1386	3.7	3.5	
653	REAL ESTATE AGENTS AND MANAGERS	1078	1308	3.4	3.3	
GENERAL OFFICE OCCUPATIONS: OES 553						
	TOTAL ALL INDUSTRIES	99608	114624	100.00	100.00	
806	HOSPITALS	15060	18132	15.1	15.8	
801	OFFICES OF PHYSICIANS	10468	12924	10.5	11.3	
602	COMMERCIAL AND STOCK SAVINGS BANKS	8836	10634	8.9	9.3	
736	PERSONNEL SUPPLY SERVICES	6862	8836	6.5	7.7	
633	FIRE, MARINE, AND CASUALTY INSURANCE	6506	7554	6.9	6.6	
739	MISCELLANEOUS BUSINESS SERVICES	6096	7444	6.1	6.5	
883	SELF-EMPLOYED	7592	6894	7.6	6.0	
508	MACHINERY, EQUIPMENT, AND SUPPLIES	5462	5968	5.5	5.2	
802	OFFICES OF DENTISTS	4818	5794	4.8	5.1	
631	LIFE INSURANCE	4872	5756	4.9	5.0	
481	TELEPHONE COMMUNICATION	5028	5220	5.1	4.6	
531	DEPARTMENT STORES	5044	5132	5.1	4.5	
610	CREDIT AGENCIES OTHER THAN BANKS, TOTAL	4098	5054	4.1	4.4	
200	FOOD & KINDRED PRODUCTS, TOTAL	5064	4666	5.1	4.1	
640	INSURANCE AGENTS,BROKERS,& SERVICES, TOTAL		3802	4616	3.8	4.0

Table 22 continued

SIC	INDUSTRY TITLE	1986 OCCUPATION EMP	2000 OCCUPATION EMP	PERCENT OCCUPATION EMP 1986	PERCENT EMP 2000
DATA PROCESSING, OFFICE MACHINES: OES 560					
	TOTAL ALL INDUSTRIES	16404	17640	100.00	100.00
737	COMPUTER AND DATA PROCESSING SERVICES	3894	3738	23.7	21.2
602	COMMERCIAL AND STOCK SAVINGS BANKS	2396	2766	14.6	15.7
893	ACCOUNTING,AUDITING & BOOKKEEPING SERVICES	1166	1466	7.1	8.3
633	FIRE, MARINE, AND CASUALTY INSURANCE	1224	1292	7.5	7.3
632	MEDICAL SERVICE AND HEALTH INSURANCE	1152	1170	7.0	6.6
739	MISCELLANEOUS BUSINESS SERVICES	926	1098	5.6	6.2
806	HOSPITALS	986	1024	6.0	5.8
508	MACHINERY, EQUIPMENT, AND SUPPLIES	770	822	4.7	4.7
801	OFFICES OF PHYSICIANS	654	756	4.0	4.3
631	LIFE INSURANCE	616	724	3.8	4.1
275	COMMERCIAL PRINTING	554	684	3.4	3.9
596	NONSTORE RETAILERS	676	572	4.1	3.2
362	ELECTRICAL INDUSTRIAL APPARATUS	496	534	3.0	3.0
271	NEWSPAPERS	396	532	2.4	3.0
481	TELEPHONE COMMUNICATION	498	462	3.0	2.6
COMMUNICATIONS EQUIPMENT OPERATORS: OES 571					
	TOTAL ALL INDUSTRIES	4482	5052	100.00	100.00
806	HOSPITALS	1362	1576	30.4	31.2
481	TELEPHONE COMMUNICATION	980	1068	21.9	21.1
739	MISCELLANEOUS BUSINESS SERVICES	644	744	14.4	14.7
801	OFFICES OF PHYSICIANS	564	674	12.6	13.3
531	DEPARTMENT STORES	544	542	12.1	10.7
602	COMMERCIAL AND STOCK SAVINGS BANKS	388	448	8.7	8.9
MAIL AND MESSAGE DISTRIBUTION WORKERS: OES 573					
	TOTAL ALL INDUSTRIES	1210	1342	100.00	100.00
602	COMMERCIAL AND STOCK SAVINGS BANKS	604	678	49.9	50.5
633	FIRE, MARINE, AND CASUALTY INSURANCE	312	344	25.8	25.6
632	MEDICAL SERVICE AND HEALTH INSURANCE	294	320	24.3	23.9

Table 22 continued

SIC	INDUSTRY TITLE	1986 OCCUPATION EMP	2000 OCCUPATION EMP	PERCENT OCCUPATION EMP 1986	PERCENT EMP 2000
MATERIALS RECORDING, SCHEDULING, DISTRIBUTION: OES 580					
	TOTAL ALL INDUSTRIES	31004	33812	100.00	100.00
531	DEPARTMENT STORES	4718	5164	15.2	15.3
736	PERSONNEL SUPPLY SERVICES	4194	4972	13.5	14.7
541	GROCERY STORES	2862	2678	9.2	7.9
514	GROCERIES AND RELATED PRODUCTS	2314	2522	7.5	7.5
596	NONSTORE RETAILERS	2262	2430	7.3	7.2
806	HOSPITALS	2084	2354	6.7	7.0
508	MACHINERY, EQUIPMENT, AND SUPPLIES	2112	2242	6.8	6.6
421	TRUCKING, LOCAL AND LONG DISTANCE	1622	1752	5.2	5.2
481	TELEPHONE COMMUNICATION	1548	1714	5.0	5.1
519	MISCELLANEOUS NONDURABLE GOODS	1562	1662	5.0	4.9
307	MISCELLANEOUS PLASTICS PRODUCTS	1274	1552	4.1	4.6
262	PAPER MILLS, EXCEPT BUILDING PAPER	1252	1228	4.0	3.6
356	GENERAL INDUSTRIAL MACHINERY	1196	1214	3.9	3.6
507	HARDWARE, PLUMBING, AND HEATING SUPPLIES	1088	1186	3.5	3.5
275	COMMERCIAL PRINTING	916	1142	3.0	3.4
FOOD AND BEVERAGE OCCUPATIONS: OES 650					
	TOTAL ALL INDUSTRIES	89674	112812	100.00	100.00
701	HOTELS, MOTELS, AND TOURIST COURT	16478	22592	18.4	20.0
541	GROCERY STORES	16412	20940	18.3	18.6
806	HOSPITALS	8870	10464	9.9	9.3
799	MISC. AMUSEMENT AND RECREATION SERVICES	7798	10404	8.7	9.2
805	NURSING AND PERSONAL CARE FACILITIES	8954	9692	10.0	8.6
793	BOWLING ALLEYS AND BILLIARD AND POOL	6458	8582	7.2	7.6
883	SELF-EMPLOYED	6734	7522	7.5	6.7
864	CIVIC, SOCIAL, AND FRATERNAL	5550	7356	6.2	6.5
546	RETAIL BAKERIES	3364	3996	3.8	3.6
836	RESIDENTIAL CARE	2050	2456	2.3	2.2
514	GROCERIES AND RELATED PRODUCTS	1768	2172	2.0	1.9
554	GASOLINE SERVICE STATIONS	1716	2170	1.9	1.9
866	RELIGIOUS ORGANIZATIONS	1574	2138	1.8	1.9
631	LIFE INSURANCE	956	1168	1.1	1.0
542	MEAT AND FISH (SEAFOOD) MARKETS	992	1160	1.1	1.0

Table 22 continued

SIC	INDUSTRY TITLE	1986 OCCUPATION EMP	2000 OCCUPATION EMP	PERCENT OCCUPATION EMP 1986	PERCENT EMP 2000
PERSONAL SERVICE OCCUPATIONS: OES 680					
	TOTAL ALL INDUSTRIES	69816	90355	100.00	100.00
883	SELF-EMPLOYED	37196	46990	53.3	52.0
723	BEAUTY SHOPS	20106	26652	28.8	29.5
799	MISC. AMUSEMENT AND RECREATION SERVICES	2376	3164	3.4	3.5
866	RELIGIOUS ORGANIZATIONS	1366	2014	2.0	2.2
835	CHILD DAY CARE SERVICES	1284	1714	1.8	1.9
531	DEPARTMENT STORES	1320	1544	1.9	1.7
836	RESIDENTIAL CARE	960	1326	1.4	1.5
724	BARBER SHOPS	996	1316	1.4	1.5
864	CIVIC, SOCIAL, AND FRATERNAL	898	1194	1.3	1.3
783	MOTION PICTURE THEATERS	780	1036	1.1	1.2
793	BOWLING ALLEYS AND BILLIARD AND POOL	720	956	1.0	1.1
839	SOCIAL SERVICES, N.E.C.	676	920	1.0	1.0
794	COMMERCIAL SPORTS	404	546	0.6	0.6
832	INDIVIDUAL AND FAMILY SOCIAL SERVICES	378	514	0.5	0.6
726	FUNERAL SERVICE AND CREMATORIES	356	472	0.5	0.5
BLUE COLLAR WORKER SUPERVISORS: OES 810					
	TOTAL ALL INDUSTRIES	24376	26530	100.00	100.00
883	SELF-EMPLOYED	4482	4730	18.4	17.8
262	PAPER MILLS, EXCEPT BUILDING PAPER	2576	2638	10.6	9.9
307	MISCELLANEOUS PLASTICS PRODUCTS	1970	2518	8.1	9.5
421	TRUCKING, LOCAL AND LONG DISTANCE	2272	2436	9.3	9.2
551	MOTOR VEHICLE DEALERS (NEW & USED)	1694	2012	7.0	7.6
351	ENGINES AND TURBINES	1810	1970	7.4	7.4
356	GENERAL INDUSTRIAL MACHINERY	1216	1312	5.0	5.0
508	MACHINERY, EQUIPMENT, AND SUPPLIES	980	1196	4.0	4.5
352	FARM AND GARDEN MACHINERY	1074	1154	4.4	4.4
371	MOTOR VEHICLES AND EQUIPMENT	1280	1154	5.3	4.4
481	TELEPHONE COMMUNICATION	1070	1146	4.4	4.3
362	ELECTRICAL INDUSTRIAL APPARATUS	1022	1128	4.2	4.3
202	DAIRY PRODUCTS	1066	1062	4.4	4.0
201	MEAT PRODUCTS	1044	1048	4.3	4.0
275	COMMERCIAL PRINTING	820	1026	3.4	3.9

SOURCE: Bureau of Labor Market Information, Department of Industry, Labor, and Human Relations, (1989).

Chapter 2: SUPPLY OF BUSINESS AND MARKETING STUDENTS

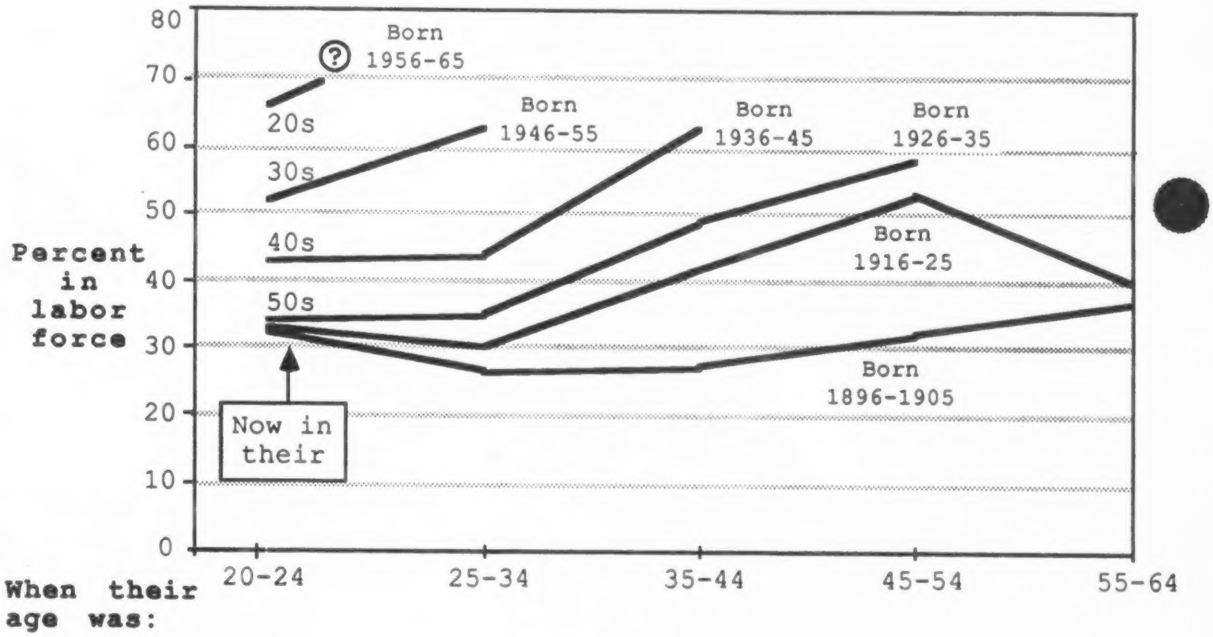
Morrison (1987) cites two dramatic trends in the supply of students to post-secondary vocational/technical education programs: 1) the rising proportion of women in the labor force, and 2) the aging of the labor force. Both of these trends will impact VTAE business and marketing education since the typical business and marketing student is a female under the age of 25.. On average, about three-quarters of the students enrolled in VTAE business and marketing degree and diploma programs are women (VTAE student records). The majority of business and marketing students are less than 25 years old. It follows that the numbers of women and youth seeking employment are particularly important to business and marketing program enrollments.

1 FEMALE LABOR FORCE PARTICIPATION

Bloom (1986) writes, "The rise in the number of working women is probably the single most important change that has ever taken place in the American labor market." Since World War II, the female proportion of the U.S. labor force has increased from 29 percent to 45 percent as female labor force participation rates jumped from 33 percent to 55 percent. At the same time, male participation rates have declined--from 87 percent in 1948 to 77 percent in 1985. BLS projections for the year 2000 bring the two participation rates even closer: 75 percent for men versus 62 percent for women. By 2000, 81 percent of women in the prime working ages of 25 to 54 are expected to be in the labor force, up from 71 percent in 1986. Nearly two-thirds of all new workers between now and 2000 will be women (Riche 1988). Figure 1 summarizes U.S. female labor force participation rate trends by age cohort.

Figure 1

Working Lives of Women: Changes Across Generations



SOURCE: Morrison (1987).

Wisconsin labor force participation rate trends closely parallel the national data. Female participation rates in Wisconsin have steadily increased since 1950. In contrast, male participation rates have steadily declined (*Wisconsin Industry Projections to 2000* 1989).

Table 25 contains the projected 2000 labor force participation rates for men and women in Wisconsin. The Wisconsin Department of Industry, Labor and Human Relations (DIHLR) projects increases in both the numbers of men and women in the labor force (not shown in table) to the year 2000, but the number of women will increase much more rapidly than the number of men. About 4 out of every 5 new workers in the Wisconsin labor force to the year 2000 will be women.

Table 25

Labor Force Participation Rates by Sex, 1980 and Projected 2000: Wisconsin

	1980		2000	
Age Cohort	Women	Men	Women	Men
16-19	54.6	58.0	58.2	58.2
20-24	72.4	84.1	80.4	85.9
25-34	67.1	94.5	80.4	92.6
35-44	68.5	95.9	84.2	93.9
45-54	63.3	93.3	75.4	91.1
55-64	44.9	75.5	46.0	64.2
65 & over	7.8	17.8	5.6	9.6

Source: *Wisconsin Industry Projections to 2000* 1989.

An obvious implication of the trends in male and female labor force participation is that more women will be needed in occupations that have traditionally been held by men. Educators should encourage women to pursue employment in these fields and to take more engineering and mathematics courses. A difficulty often cited by women who enroll in non-traditional programs of study is the absence of a peer group for support. Such networks can be established to eliminate this impediment to education for women with non-traditional interests.

The data on female participation rates for the U.S. also provide evidence that the changes in female work patterns are qualitative as well as quantitative. More than ever, women are seeking career employment opportunities. The largest increase in female participation rates has occurred among the 25 to 34 year olds, a group that previously was more likely to leave the labor force during child-bearing years. Women in this age group now have participation rates in excess of 70 percent (Norwood 1987). Even more striking is the increase in the participation rate of married women with children younger than age six; their labor force participation went from 12 percent in 1950 to 54 percent in 1985, evidence that a majority of women are choosing to combine parenting with a career.

Women are also taking more full-time, year round jobs. In the early 1950's 38 percent of the women who worked more than 35 hours per week also worked from 50 to 52 weeks per year. That proportion had risen to 48 percent by 1986. The number of female entrepreneurs has increased dramatically in the past 30 years. In 1960 women started only one in ten new businesses. In 1985 women were the owners of one in three start-up businesses and by 1995 that proportion is expected to increase to one in two. The proportion of women in management positions has also been growing. In 1972 27 percent of the managerial positions in the economy were filled by women. By 1979 the proportion was 32 percent, and by 1986 it had reached 36 percent (Bloom 1986).

Despite these substantial changes in female employment patterns, young women entering the labor force do not seem to be well informed about the importance of making career plans. Analysis of data from the National Longitudinal Surveys of Labor Market Experience of Young Women shows that women have consistently underestimated the number of years that they will be employed full-time and that this underestimation is associated with lower earnings (Shaw and Shapiro 1987). After controlling for other factors, women who planned to be in the labor force at age 35 had significantly higher average earnings than women who did not anticipate working at that age. One implication to be drawn from this finding is that historically women have not given enough attention and foresight to choosing a career, and as a result they have suffered economically. This suggests that young women need to be provided with better information about the likelihood of future employment and the importance of planning ahead for their working lives.

2 AGING OF THE LABOR FORCE

The aging of the labor force represents a second significant change in the supply of business and marketing students. The median age of the labor force will rise from 35.3 years in 1986 to 38.9 years in 2000. Although this is still below the post-war peak of 40.6 years in 1962, it is substantially above the 1980 figure of 34.6 years. This change reflects the maturing of two age cohorts, the "baby boom" generation and the subsequent "baby bust" cohort. Between 1986 and 2000,the share of the labor force in the prime working ages (25 to 54) will grow by 1.7 percent per year, while at the same time the youth work force (aged 16 to 24) will decline by 0.2 percent per year. As a result of these different growth rates, the proportion of the labor force aged 25 to 54 will increase from 67 percent in 1986 to 73 percent in 2000. Youths will account for only 16 percent, down from 20 percent (Riche 1988).

In addition, the labor force will grow much more slowly than it has for the past 20 years. The Bureau of Labor Statistics (BLS) projects the labor force will grow by only 1 percent per year in the 1990's, down from a 3 percent rate in the 1970's and 2 percent in the 1980's (Fullerton 1987). As labor force growth slows, entry-level employees will become harder to find. The Committee for Economic Development estimates that there may be a shortfall of over 23 million workers in the early 1990's (*U.S. News and World Report*, June 26, 1989).

The shortage of entry-level employees is likely to be most strongly felt in the labor intensive service industries, which are the area of greatest projected job growth. A study by the National Restaurant Association found that its members "...could experience a shortfall of 1 million workers by 1995." A report by the National Retail Merchants Association found that: "Youth shortages impact the retail business more than many other industries." (*Business Week*, August 10, 1987)

In response to the predicted shortage of youth workers, some employers have begun to change their recruiting, compensating, and promoting practices in order to attract a larger share of the female labor force. IBM, US WEST and others are developing extensive child-care referral services. Hewlett-Packard and Lotus Development have expanded their maternity leave policies. BankAmerica has altered its career ladders so that more female tellers will become vice-presidents (*Business Week*, August 10, 1987).

A second result of the older labor force has been a surge in adult education in this country (Edmondson 1987). From 1969 to 1984, the number of people taking adult education courses grew by 79 percent. Over this 14 year period, while population growth slowed, the adult education market more than doubled. In addition, the subjects adults take have changed. In 1969, only one-quarter of the courses adults took were job-related. By 1984, 43 percent were job-related. Adult education is becoming more closely tied to careers.

Three factors lie behind this trend. First, the share of the labor force in the prime working ages (25-54), the age group most likely to take adult education courses, has been growing as the baby boom cohort matures. The influence of this process will continue for another 15 years. Second, changing skill needs are causing more adults to return for upgrades in their education. Third, the surge of baby boomers striving to move up the career ladder, coupled with business organizational changes that have eliminated middle management jobs has made internal job competition unusually keen. Improved educational qualifications are one way to improve a job candidate's standing.

The focus upon career objectives in the adult education market has implications for business and marketing educational offerings. Research at the Battelle Memorial Institute suggests that there is a strong demand in the adult educational market for short, occupationally oriented seminars. Two week seminars for top executives have been an important growth area for many graduate business schools (Edmondson 1987). Demand for short, occupational upgrade programs in the vocational/technical area is also likely to grow. Historically, many U.S. firms have had a "test, not invest" attitude toward their entry-level employees. For example, Xerox Corporation, which operates an international training center for its management trainees, does not offer its clerical and service help any formal training (*U.S. News and World Report*, June 26, 1989). As the pressure to retain mid-level employees grows and entry-level employees become more scarce, this attitude is likely to change.

Chapter 3: SUMMARY AND CONCLUSION

1 SUMMARY OF FINDINGS

In this document we have reviewed economic and demographic trends affecting the supply of business and marketing students and the demand for graduates of business and marketing programs. The outstanding characteristics of these trends are:

- Service occupations will provide virtually all net employment gains for the next decade;
- Advances in the information technologies used for electronic communication, database management, decision-making, and document creation will affect skills requirements and the demand for employees in virtually all business and marketing occupations;
- New information technologies are generally associated with increased operator skill requirements, although this outcome depends heavily upon management implementation decisions;
- The pace of technological change requires increased occupational training for employees at all levels of experience and career advancement;
- The organization of office operations is changing to emphasize flexibility, productivity, and employee initiative;
- Micro-marketing techniques will be more widely used in the 1990s;
- Businesses will compete more on product and service quality and less on price;
- Employers and other private providers of occupational training will increase their training efforts;
- Most new entrants to the labor force will be female;
- The working population will be older, and entry-level employees will be harder to find.

Rapid growth in service occupations will continue to dominate the employment picture in Wisconsin. In recent years, service employment has increased much more rapidly than has manufacturing employment. This trend is expected to continue. Looking at 11 industries where most business and marketing graduates find employment, SIC 73, Business Services, which accounted for 10 percent of the total employment among these industries in 1975, provided 25 percent of the employment growth (*Wisconsin County Business Patterns*, 1975-1986).

The most rapidly growing service jobs pay relatively well and offer opportunities for career advancement. Paralegal personnel, computer systems analysts, electronic data processing equipment operators, and employment interviewers are among the fastest growing occupations in Wisconsin (DIHLR 1989). Moreover, in the low-pay, low-skill service occupations there is pressure to upgrade skill requirements. The supply of young, inexpensive, unskilled labor is diminishing. Employers like MacDonalds, used to relying on young, inexperienced labor, have started to buy more labor-saving capital equipment (Morris 1989). As the capital intensity of the relatively low-level service jobs increases, more highly skilled employees will be required.

A second significant movement within the service sector is the "unbundling" of service occupations which are internal to an establishment. In the traditional business enterprise, office support and maintenance workers are on the company payroll. Today, these workers are increasingly likely to receive their check from someone else. The dramatic growth in the Business Services industry, mentioned above, is a direct result of this phenomenon. The most dynamic sectors within Business Services--SIC 733, Mailing, Reproduction and Stenographic Services, SIC 736, Personnel Supply Services, and SIC 737, Computer and Data Processing Services--are traditionally internal functions. Some important factors driving this growth are: advances in information technologies, a need for organizational flexibility, and a desire to contain costs.

Information technologies will impact virtually all business and marketing occupations. One of the most rapidly growing business and marketing occupations in Wisconsin, Computer and related occupations, is directly connected to the use of information technologies. Other occupations, such as retail sales , are indirectly affected by information technologies through equipment like electronic point-of-sale devices and videotex.

Information technologies will require some new occupational competencies. Business and marketing students should have a basic understanding of data communications, including familiarity with modems, LANs and communications software. They should know how to use computer databases to do research. Electronic databases are especially important for marketing and legal research. Students should be able to use spreadsheets to analyze a variety of decision problems. Word processing specialists will be more involved with entire documents. They will need increased graphics and page layout skills. Most business and marketing students will not need computer programming skills, although an understanding of programming principles will help all students be more effective computer users.

Businesses are under increasing pressure to respond flexibly to a rapidly changing marketplace. The recession of the early 1980's, international competition, and increasingly fragmented consumer markets have underscored the need to develop business organizational structures that function well in dynamic markets. The new business structure is flatter, with fewer layers of hierarchy between productive operations and top management. In addition, it gives more responsibility for innovation, customer service, and quality control to all levels of the organization. Efforts are being made to turn non-production activities like billing and inventory into strategic assets for the firm. Information generation and distribution is a key competitive activity in a chaotic market.

Advances in information technologies have enabled firms to undertake many of these organizational changes. Computer networks and intelligent office machinery make it possible to integrate previously distinct business functions, and to generate, analyze and synthesize much larger volumes of information.

The increasing use of micro-marketing techniques represents one important juncture of rapidly changing markets and information technologies. Markets today are becoming fragmented. Micro-marketing is a phrase applied to unusually narrow target marketing. Target marketing products and services to different market segments has been common practice for many years. What makes micro-marketing distinct are the methods used to deliver the advertiser's message and the precisely identified group to whom the message is addressed.

Market research firms are gathering unprecedented amounts of information about the American consumer. One research company recently surveyed some 25 million consumers to learn about their tastes and purchasing patterns (*Business Week*, August 28, 1989). Detailed knowledge of fragmented markets requires massive data sets like these. It also requires telecommunications and information processing skills to gather and analyze the data. These skills will become more critical to business as micro-marketing replaces mass marketing as the advertising method of choice.

Since they involve employees in a wider variety of tasks, flexible organizational structures and integrated information systems are generally associated with a broadening of the required skill base, although the need for some occupational competencies may be diminished. In addition, the need for more general and abstract skills is increased. Competent work in a flexible office structure is more dependent on an ability to communicate and negotiate, numeric literacy, an ability to learn new tasks, and abstract reasoning.

The pace of improvement in information technologies is unlikely to slow in the next decade. In order to stay current and productive with the new equipment, employees will need continuous occupational training throughout their working lives. Consequently, adult occupational training will be a significant growth area for business and marketing education.

In response to the need to keep their workforce technologically up-to-date, employers will be increasingly likely to offer continuous occupational training as a benefit to their employees. For small businesses which cannot afford expensive in-house programs, outside agencies will provide the training.

The level of competition for the provision of post secondary occupational training is increasing. Some business leaders have expressed dissatisfaction with public providers, and private training providers are aggressively pursuing students (De Master, in Wacker 1987). Successful business and marketing programs will need to take these two challenges seriously.

The business and marketing student population will be older and disproportionately female. It is likely to contain a smaller proportion of students directly out of high school and more students who have already been in the working world for some time. Most of the new entrants to the labor force in the next decade will be women seeking their first job (Norwood 1987). Women will be needed to meet the demand for employment in occupations traditionally held by males and should be encouraged to enroll in non-traditional programs of study.

2 CONCLUSION

The balance of the evidence that is available shows that occupations will be more cognitive in nature and more oriented toward responding to unique or unusual opportunities. At Aetna Life and Casualty it used to be the case that anyone who could read could process insurance claims. Today, as clients push to hold down costs, employees must interpret and analyze claims. For instance, claims processors must now certify that a doctor or dentist has used the correct procedure before authorizing payment (*Business Week*, August 10, 1987).

The division of labor between employees and computers in business and marketing occupations is changing. Information technologies are replacing the repetitive and "automatic" components of the information generation and distribution process. The implication is that employees, and the programs that prepare them for employment, should focus on skills that are important in dynamic, flexible work environments.

These include skills such as:

- Ability to continually learn;
- Ability to solve problems and reason abstractly;
- Skills of imagination, intuition, and creativity;
- Ability to adapt to change; and
- Ability to communicate and negotiate.

Perhaps the most important of these skills is communication. "Communication skills . . . go beyond just writing and speaking. They include listening, interpreting, presenting, and probably most importantly, negotiating. There is a growing need to negotiate between different ideas, different cultures, and between the past and the future" (Zach, in Wacker 1987). Improvements in information technology have created a world with more variety, more differences and more room and need for negotiation and compromise.

The pace and uncertainty of technological change suggest a need for increases in the flexibility of job skills and in the ease and speed with which workers learn new skills. A solid foundation in the skills fundamental to an occupation makes it easier to switch jobs. "Because no one can predict precisely how pervasive the [information technology] equipment will be or how it will change the number and types of employment opportunities, it is not realistic for workers, of the systems that train them, to make long term plans based on specific technologies." (*Computers in the Workplace*, 1986) Workers trained in the fundamentals of information systems will be able to more rapidly and effectively make the adjustment to the new technology.

Of course, flexibility cannot substitute for specificity. Workers will continue to need skills specific to the employment that they choose. Business leaders see a growing need for detailed, technical skills in addition to the more general skills noted above. "Technicians' training must be specific, not generic" (De Master, in Wacker 1987).

Rapid improvements in information technologies have resulted in two trends with potentially conflicting implications for training. The increasing complexity of many employment tasks creates a need for in-depth, technical skills, but the speed at which employment demands are changing suggests that these detailed skills may quickly become obsolete. Rapid change requires more emphasis on fundamental employment skills. These demands correspond to two conceptually distinct services that business and marketing programs provide.

Shaffer (1989) has pointed out that ". . . the creation of a labor force and the creation of jobs in a modern society are almost independent processes." The VTAE system provides one of the few links between these processes. Business and marketing programs connect the public interest in a productive, employed labor force with business needs for specific occupational competencies. The VTAE is a public service organization in that it provides labor with important employment skills. However, as a provider of occupational competencies the VTAE is a business service organization. One way to think about potentially distinct training needs is that the need for increased attention to employment fundamentals reflects a concern that the Business and Marketing Division faces as a public service entity, while the demand for more specific technical training relates to the provision of a business service.

By considering business and marketing programs in terms of these two roles it is possible to resolve in some measure the need for both improved fundamentals and increased technical expertise. The Business and Marketing Division's core programs, the two year degree and one year diploma programs, are a natural vehicle for expanding basic skills education and developing a broad foundation in the essential occupational skill competencies. The business and marketing contract services provided as part of the VTAE system's economic development activities offer a resource for employer-specific training. The very rapid growth of these courses indicates the presence of substantial demand for this business service. Business calls for more employer-specific courses should be met by efforts to expand the contract and non-contract economic development activities.

There will be reduced growth in the number of 18-25 year olds enrolled in business and marketing programs. However, structural change and demographics issues point to several growing markets in Wisconsin with unique educational needs. Demand for occupational training is growing most rapidly among existing employees, as opposed to new entrants to the labor force. Sustaining enrollment growth will require continued development of business service activities, like the business and marketing economic development activities, and a more aggressive campaign of marketing those programs.

APPENDIX A

There are several economic models which explain the effects of new technologies on employment.[1] However, none are sufficiently general to provide a complete explanation of the entire relationship. The simplest analyses ask which job functions the new technology replaces or augments, how much less labor it requires, and how much more output is produced by the new system. From these questions one can determine which occupations (or functions and tasks) the technology will render obsolete and how many employees (or functions and tasks) it will replace. This approach ignores the relationship between the firm and its economic environment and instead focuses entirely upon the mechanical characteristics of production. From this perspective, improvements in the technology of production reduce employment by definition, since a more efficient production process requires fewer inputs.

A more complete, but much more complex, understanding of technology's effects upon employment is gained from a dynamic perspective. A new technology may change a whole set of relationships, including those between a firm and its competitors, an industry and its substitutes, employees and their occupational tasks, and the firm and its employees.

For example, a new technology is likely to give the firm which pioneers its use a competitive advantage, either because it lowers costs or improves the quality of the firm's product. This, in turn, will likely increase demand for the firm's product and cause the firm to require more employees. Whittle Communications, the creator of *Channel 1*, an innovative news program broadcast to high schools during homeroom, projects 30 percent increases in employment for each of the next four years.[2] Now suppose that there is essentially a fixed level of demand for teenage advertising. Then an increase in the market share of Whittle Communications is necessarily a decrease in the shares of other firms in the market. In essence, the carefully targeted "niche" marketing concept promoted by Whittle Communications may simply supplant more traditional mass market, general interest media advertising. The effect of the innovation under these assumptions is a change in marketing methods, but not necessarily an increase in marketing employment. Total employment in the industry may decrease, even though employment in the innovating firm has increased.

In time, the other firms may adopt the innovation themselves and regain some of their lost market share. The spread of a new technology across firms and industries is known as diffusion.

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[1] Bosworth (1983) contains a representative collection of models.

[2] MacNeil-Lehrer NewsHour, June 7, 1989.

Diffusion rates partly determine how rapidly a new technology will affect labor markets.

Diffusion effectively transfers the effects of a new technology throughout the economy. It is widely believed that new technologies generally result in an increase in total employment, despite the fact that, from a static perspective, employment must decrease.[1] The reason for this belief is that the efficiency gains from the new technology may create multiplier effects.

Multiplier effects are the most difficult dynamic factor to account for in empirical studies of the employment effect of information technologies. Multiplier effects arise from the exchange relationships which exist between sectors of the economy. In particular, a price decline in industry A may lead industry B to increase its demand for A's product, causing increased demand for employees in industry A. Similarly, the decline in industry A's prices may allow industry B to lower its prices to industry C, which can then increase its demand for industry A's product, and etc. The net effect of the employment decreasing efficiency gain and the employment increasing multiplier effects is ambiguous. If multiplier effects outweigh efficiency gains, then employment in the innovating industry will increase. The historical record suggests that most innovations have eventually led to employment increases, but that these increases may take place over a period of many years. Most models attempt to make a positive adjustment in their estimates of employment demand for the effects of productivity driven price declines on industry employment demand.

Diffusion and multiplier effects are essentially quantitative effects of a new technology. That is, they lead to changes in the number of persons employed, but not necessarily in their job tasks. Two other relationships mentioned above, those between employees and their occupational tasks and between firms and their employees, influence the qualitative effects of a new technology. A new technology may alter the skills that employees need. Some technologies are skill enhancing while others tend to deskill workers. Other technologies may do both. For example, automatic teller machines free bank tellers from many of their most routine transactions. As a result, tellers are able to become more involved in marketing and selling bank services.

In addition, a new technology may be used to change the structure of control or organization of work processes. For example,when word processing systems were first introduced they were promoted as a means to keep track of and report keystrokes/minute (Gill 1985). One of their chief advantages over mechanical typewriters was thought to be the increased control over the work flow that this reporting afforded. Today this capability of word processing systems is largely ignored. Instead, firms are focusing on the substantial improvements in the quality of documents that sophisticated word processing and graphics make possible.

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[1] This claim is difficult to conclusively support with available data.

Compounding these conceptual problems are practical problems that make the employment effects of new technologies difficult to assess. First, it is difficult to define a measure of technological intensity that is consistent and reliable. Roach (1987) provides two estimates of technological intensity in 37 service industries (presented in Table 26). The correlation coefficient between these estimates is $r = -0.2$. A correlation coefficient of -0.2 indicates that the two estimates may not measure the same thing. This suggests that the same technology diffusion process could generate very different estimates of the rate of diffusion depending upon what definition and measurement of information technology is used.

Moreover, the pace of technological change varies considerably by industry and among plants within industries (Mark 1987). Larger firms adopt new information technologies much more rapidly than smaller ones. Consequently, estimates of the rate of diffusion are sensitive to the sample data observed. In addition, the industries that are most likely to adopt new technologies are those that are experiencing strong demand for their product(s) (Norwood 1987). In these industries any labor displacing effects associated with the new technology are likely to be overshadowed by increases in labor demand caused by the growing market.

Finally, it is important to note that it is unusually difficult to measure the productivity of information technologies because the important measure of information is its quality, not its quantity. As a result, most studies of the introduction of information technologies find little evidence of any significant productivity change.[1]

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[1] See, for example, Franke 1987.

Table 26

Technology Intensity Measures (TIMs)*

	TIM1	TIM2
Transportation	0.9	0.1
Rail	0.4	0
Nonrail	1.3	0.1
Air	3.4	0.2
Trucking	1.7	0
Other	0.8	0.1
Communications	0.6	4.3
Telephone and telegraph	0.6	4.4
Broadcasting	0.8	2.6
Public Utilities	1.3	0.3
Electric	1.2	0.3
Gas and other	2.3	0.2
Total trade	2.1	0.9
Wholesale trade	2.1	1.8
Retail trade	1.3	0.3
Finance, insurance and real estate	1.1	1.2
Finance and insurance	2.7	2.2
Banks (including Federal Reserve)	3.1	2.1
Credit agencies	3.5	2
Securities brokers	1.8	2.5
Insurance carriers	2.4	3.1
Insurance agents	1.3	2.6
Investment holding companies	1.4	2.5
Real estate	0.7	0.8
Services	0.9	1.3
Hotels and lodging	5.3	0.1
Personal	0.4	0.9
Business	1.2	2.3
Auto repair	3.5	0.1
Miscellaneous repair	2.4	0.2
Motion pictures	0.6	3.4
Amusement and recreation	0.7	1.6
Other	0.8	1.9
Health	0.7	2.4
Legal	1.5	1.1
Educational	1.8	3.8
Other	0.7	0.8

* TIM1 is each industry's change in technology endowment from the 1970's to 1985, relative to the average change for all industries. TIM2 is each industry's 1985 technology endowment relative to the all-industries average. Technology intensity measures are Morgan Stanley estimates derived from the Industry-Commodity Capital Stock Matrix of the U.S. Department of Commerce.

Source: Roach 1987, p. 398.

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